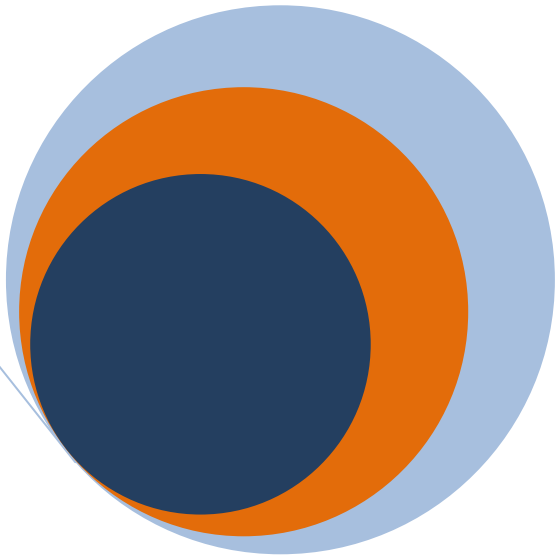
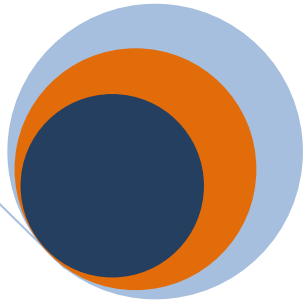




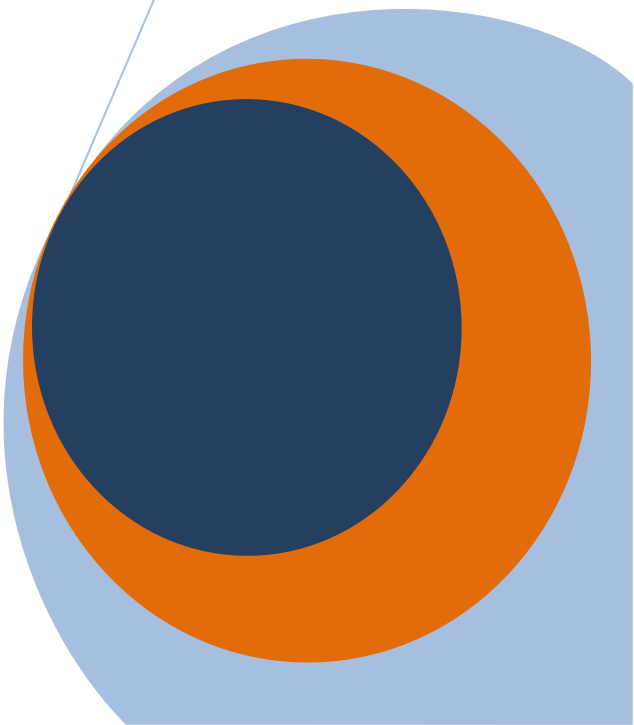
GenExis user guidelines for teachers

Leonardo da Vinci Programme

Transfer of Innovation Project "Computer based Exercise Generation and Evaluation System for Mathematics, Physics and Chemistry Subjects – GENEXIS"

LLP-LdV/TOI/2007/LV/003

SIA „Data Pro Grupa"
2009

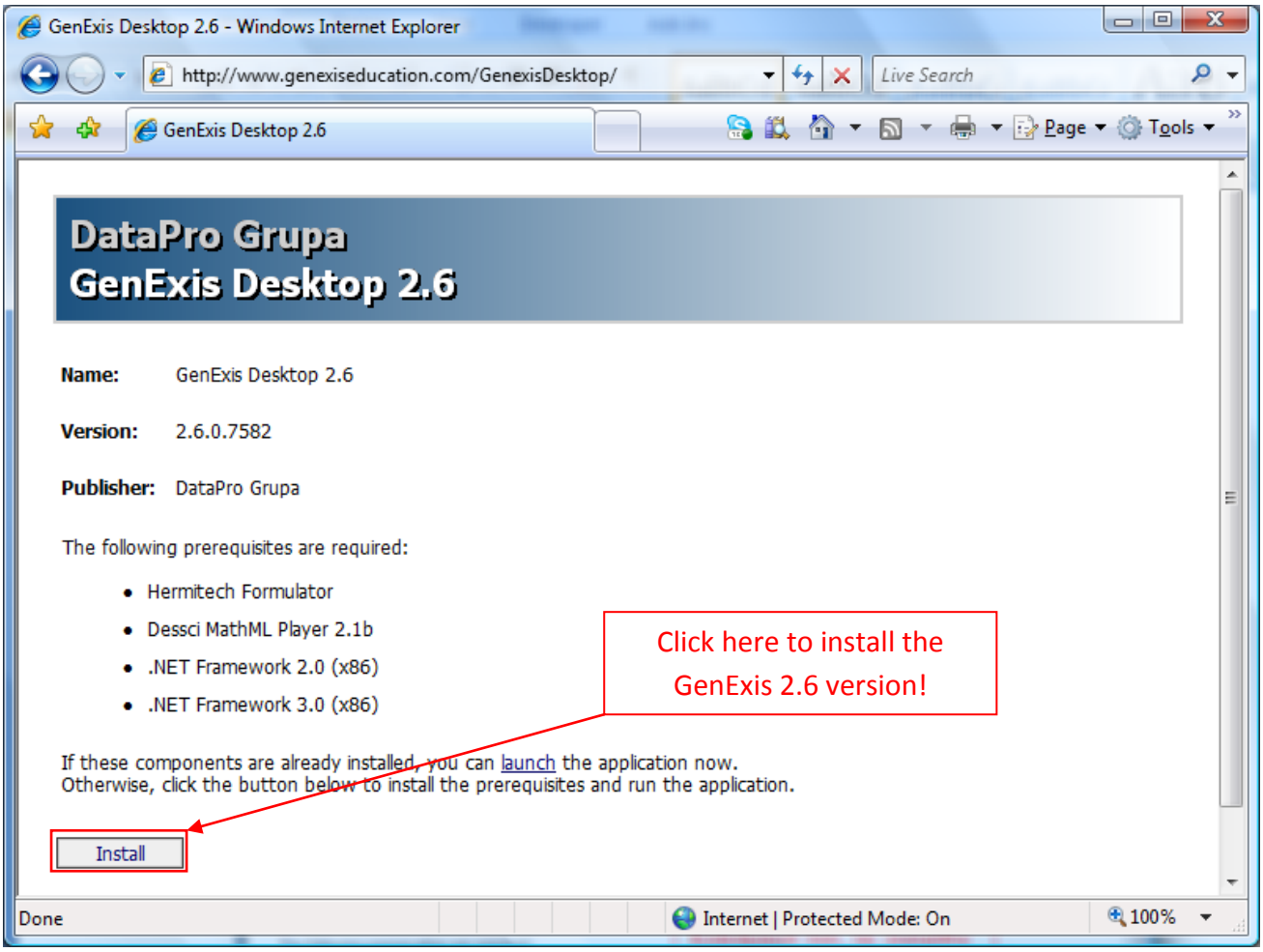


Content

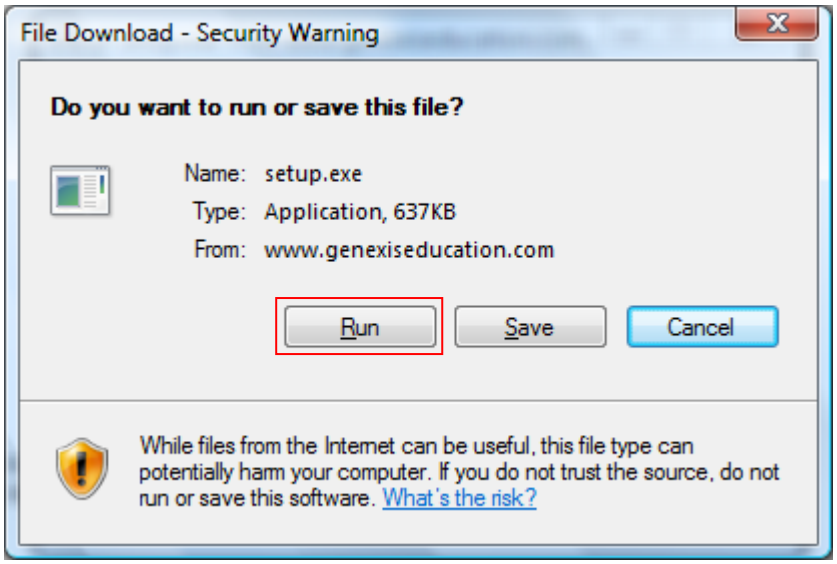
Theme 1: GenExis installation

The installation of GenExis 2.6 is available for the **Windows XP (SP2)** or **Vista** operating systems. For the installation to be successful, sequentially perform the following steps.

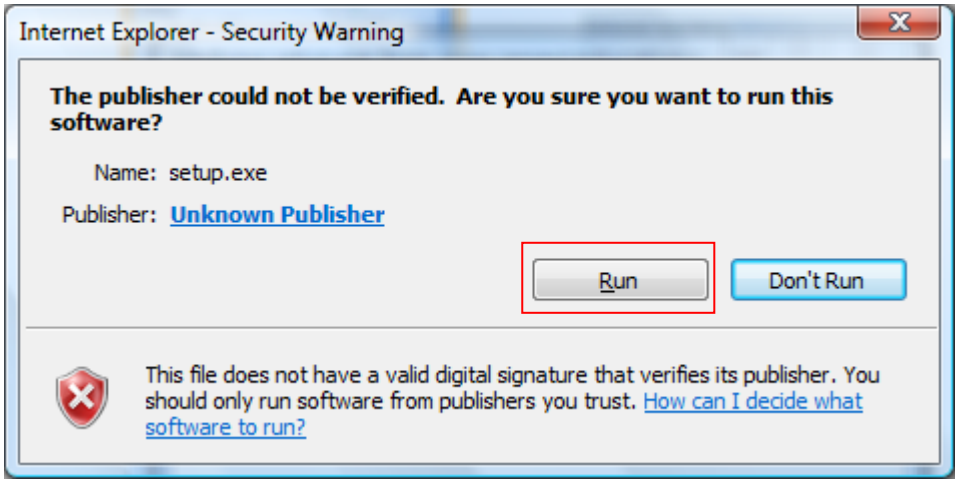
1. Open the following site: http://genexiseducation.com/GenExisDesktop/, using **Microsoft Internet Explorer 6.0** or a newer version (it won't be possible to perform the installation through another Internet browser). The home page which will open is shown in the following picture.
2. To install the GenExis 2.6 version, click on **„Install"!**



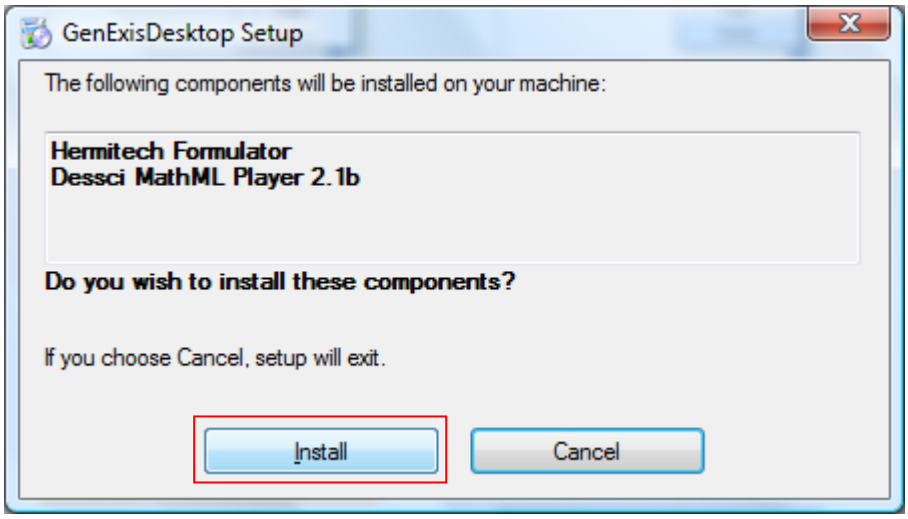
3. Sequentially Windows will offer you to “Save” or to “Run” the file. Click on „Run” (see picture).



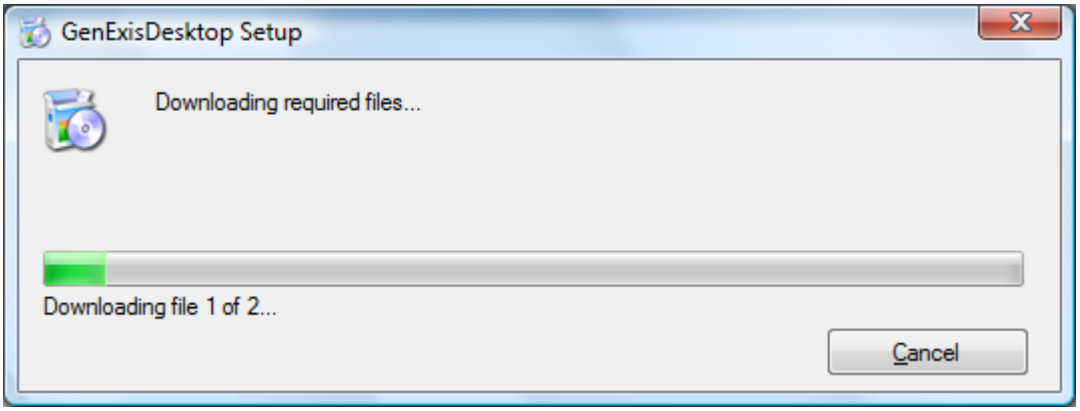
4. Then a warning with a question will appear: Are you sure you want to run this software? Again select “Run” (see picture).



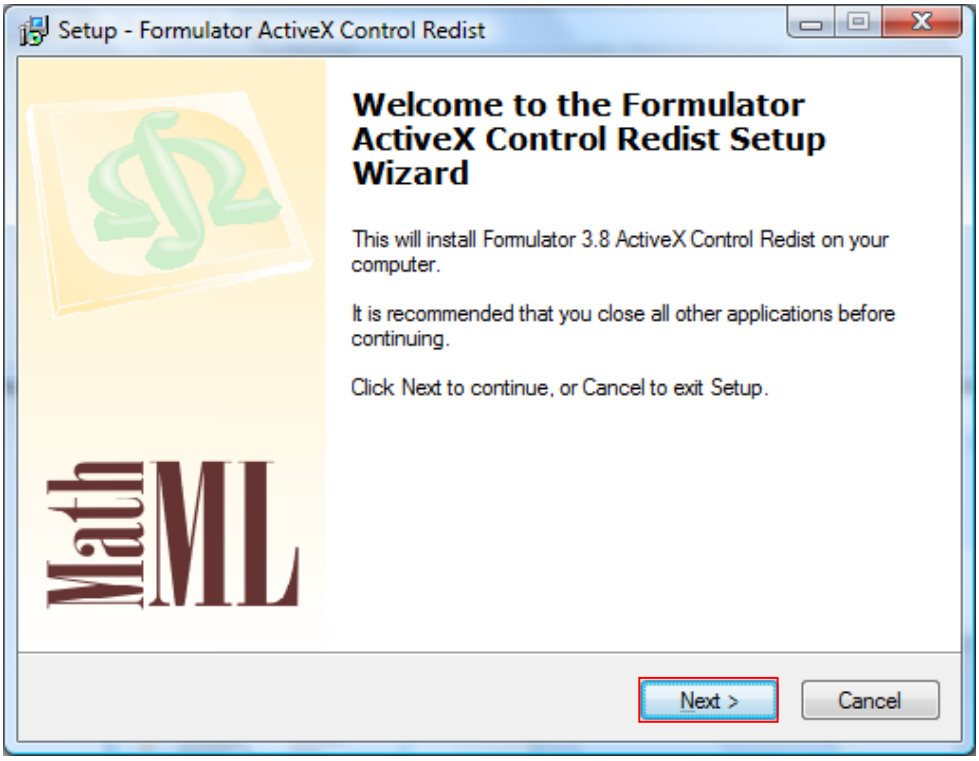
5. The next step of the installation is to install the Hermitech Formulator and Dessci MathML Player 2.1b. When the window with the question: Do you wish to install these components? appears, click on "**Install"!**



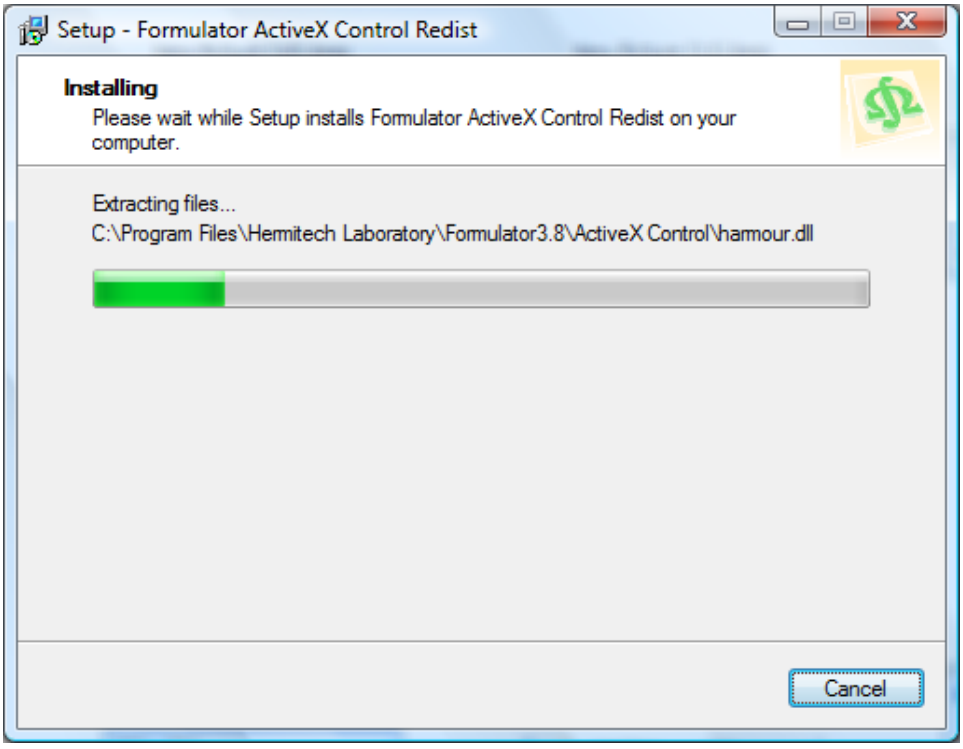
6. Please, wait while all the required files are downloaded!



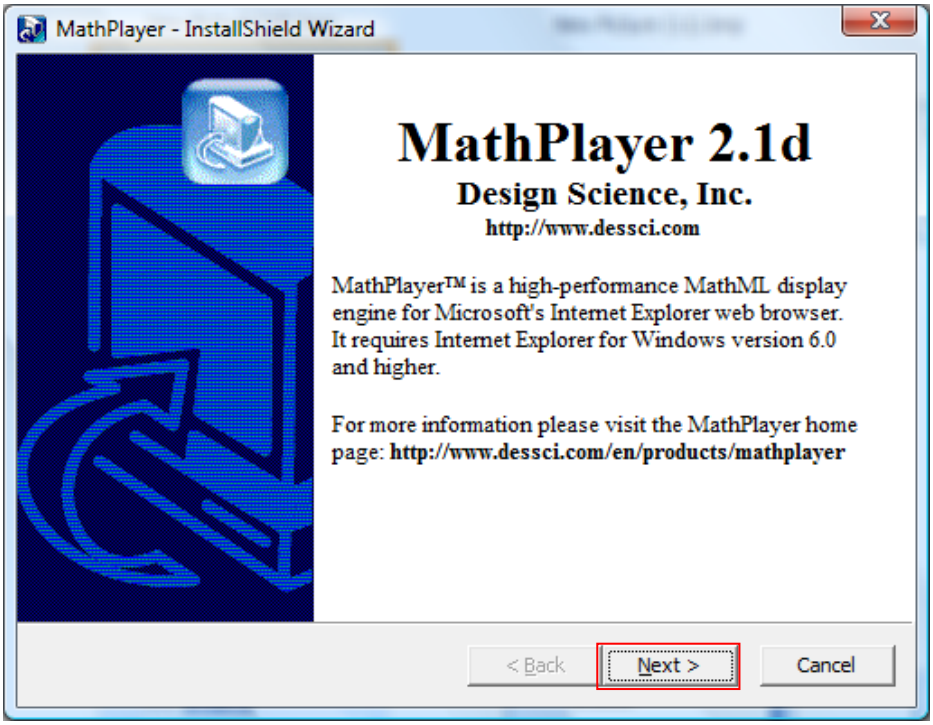
7. When the next window opens, click on “Next”.



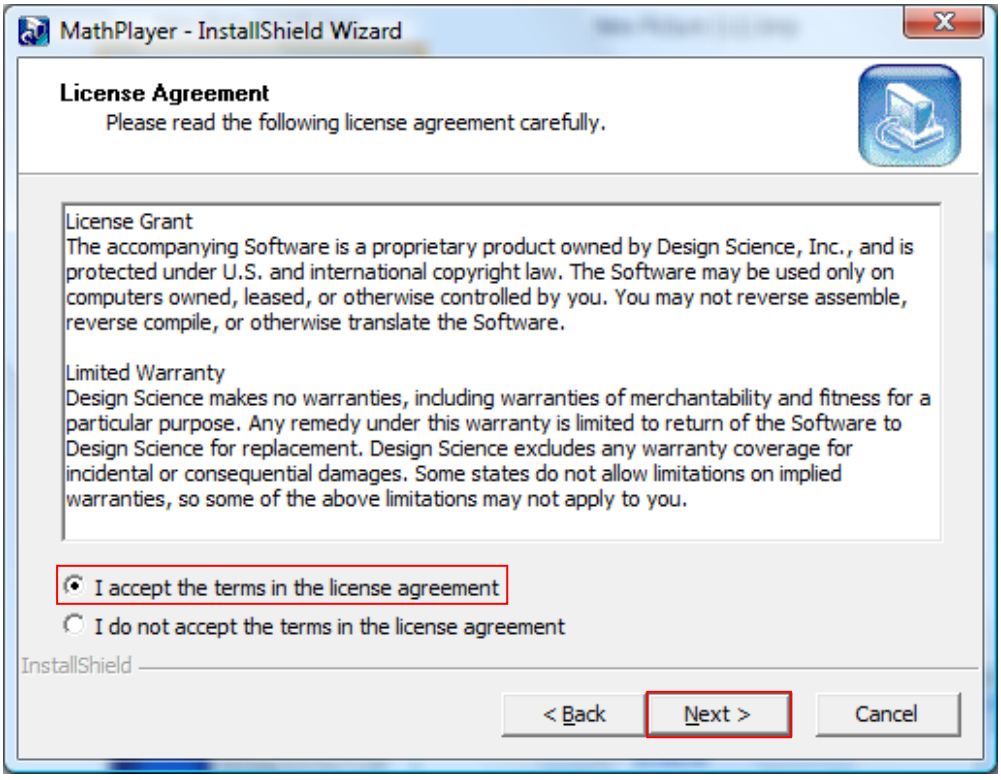
8. Please, wait while the installation process is completed!



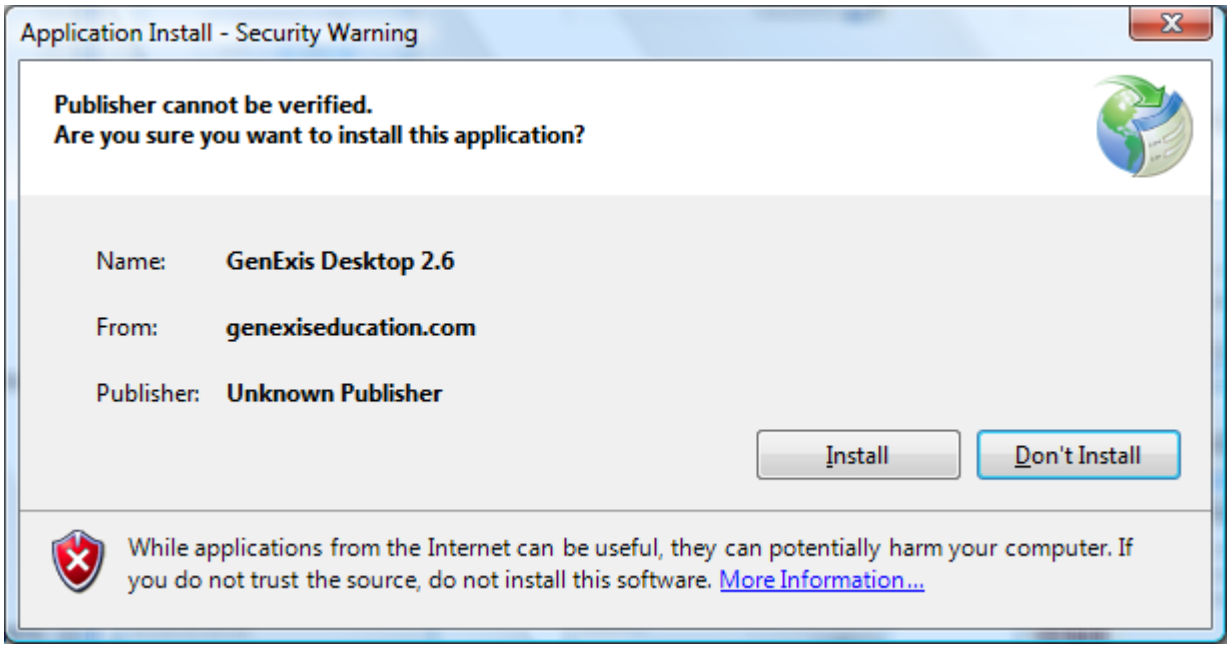
9. When the next window opens, click on “Next” again!



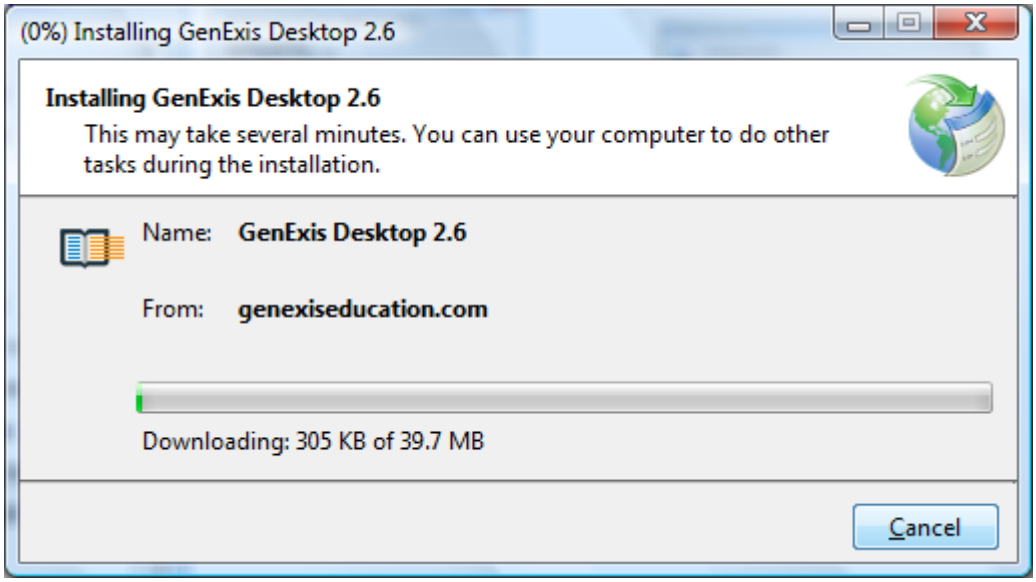
10. In the following window select „I accept the terms in the license agreement” and again click on “Next”!



11. When another window appears with the question: Are you sure you want to install GenExis Desktop 2.6? Select "**Install**" to start the installation process!



12. Please, wait while the programme is downloaded and installed!

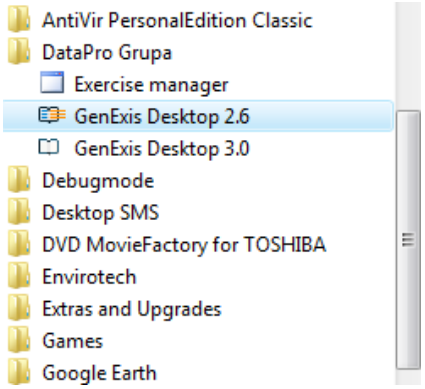


Congratulations! You have successfully installed Genexis!!!

Theme 2: How to log in to the GenExis system and the user's desktop

After the GenExis installation, the application will automatically open the starting window.

Later you will be able to find the GenExis programme by clicking on "Start" → „All Programs" → „DataPro Grupa" → „GenExis Desktop 2.6" (see picture).

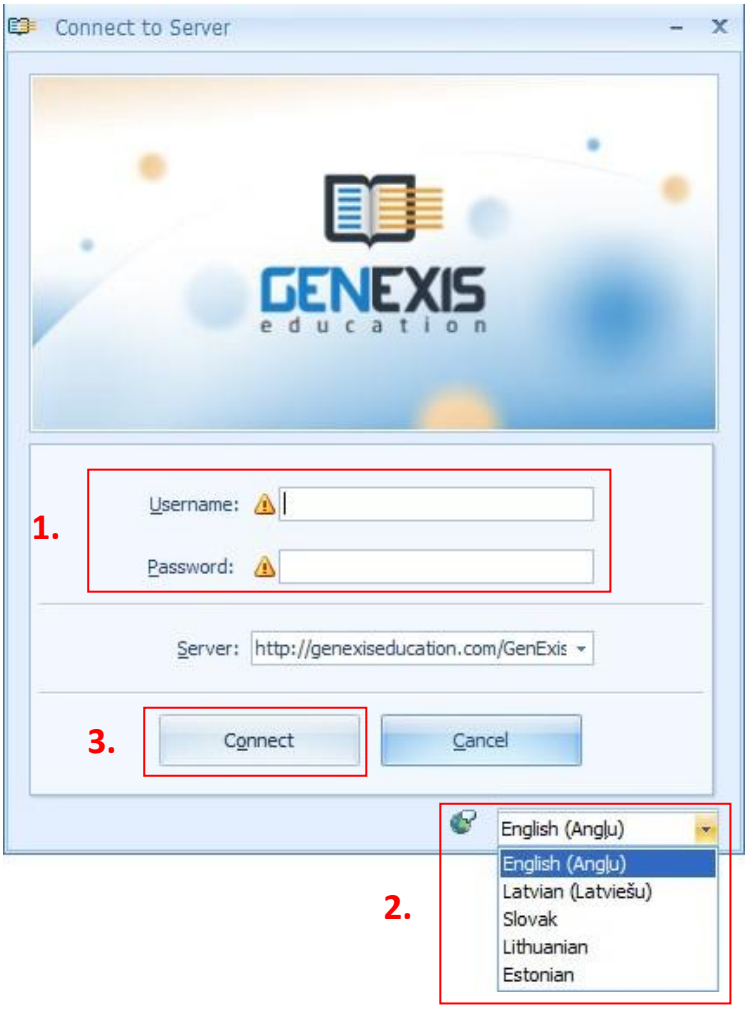


How to log in to the Genexis system?

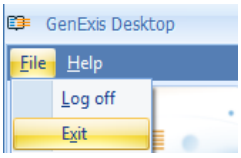
1. Enter your user name and password in the provided areas (see picture).

2. From the offered options select the preferable work language (see picture).

3. Click on "Connect" (see picture).



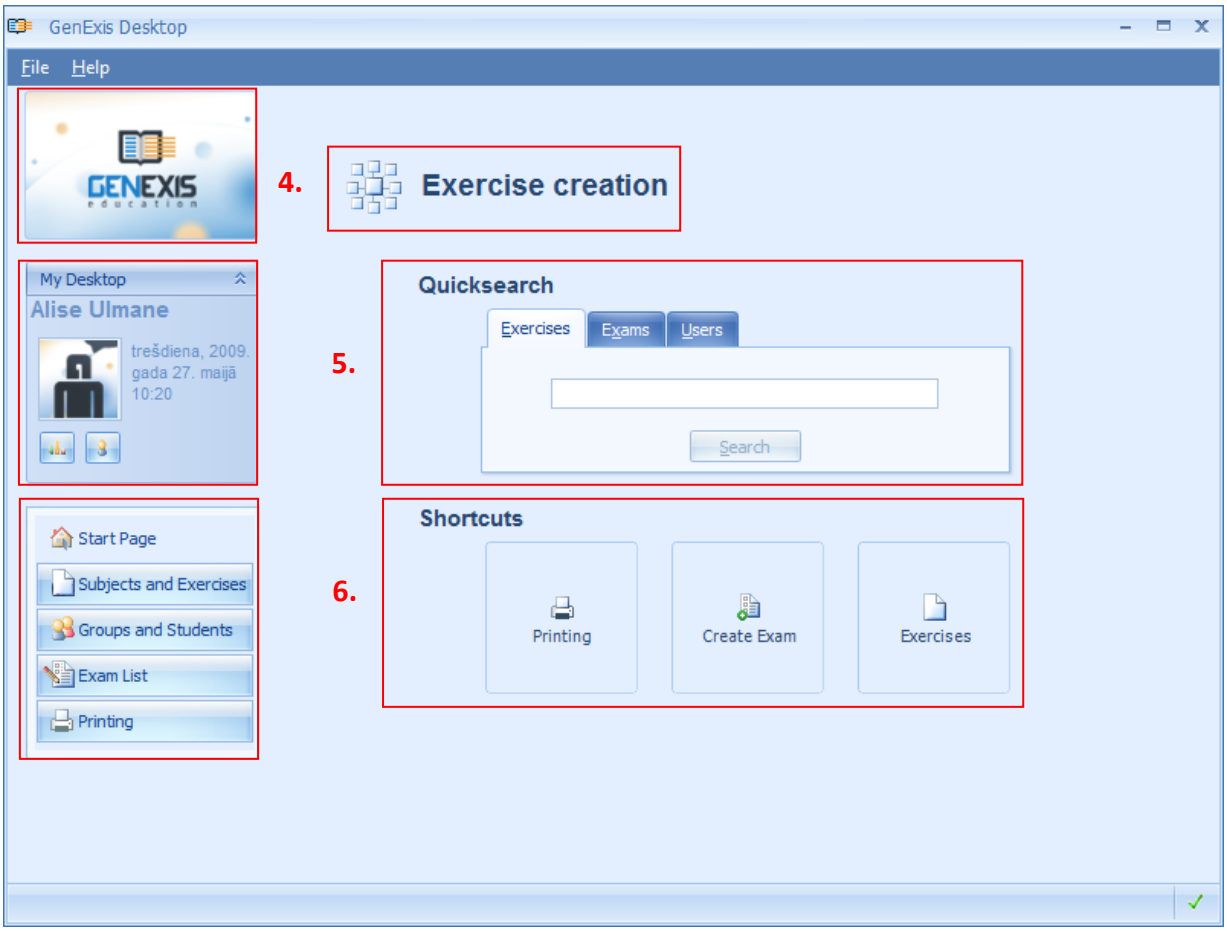
To exit the programme after logging in you must open File and select **Log off** (to change the user or the educational institution) or **Exit** (to completely close the system).



GenExis desktop

Elements of the GenExis first page:

1. GenExis logo
2. User information and date
3. The menu
4. Name of the educational institution
5. Quick search
6. Shortcuts

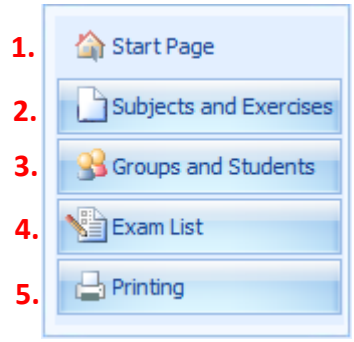


The functionality of the GenExis desktop elements:

1. GenExis logo – by clicking on GenExis logo the main page will open (if you are in any other window).

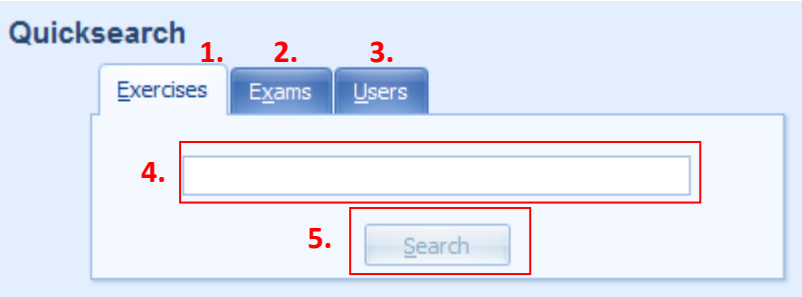
2. Information about user and date: it displays user's name and surname [1], user`s photo [2], if it is uploaded onto the system, date and time [3], personal statistics icon [4] by clicking on which a separate window will open displaying personal statistics data (see Theme 21), user's information icon [5] by clicking on which the user's personal information window in editing mode will open (see Theme 6). This section can be closed by clicking  right next to the title "My Desktop" (afterwards it is possible to extend it likewise).

3. Menu: allows getting in the selected window by clicking left mouse button once. Namely, by clicking on "Start Page" [1] the user returns back to the start page from any of the windows, by clicking on "Subjects and Exercises" [2] the user opens a subjects and exercises menu, by clicking on „Groups and Students" [3] the user opens the menu of the selected education organization group (e.g. forms) and users, by clicking on „Exam List" [4] the list with all the exams available to the user opens up, by clicking on „Printing" [5] the user opens the list with all printing materials.

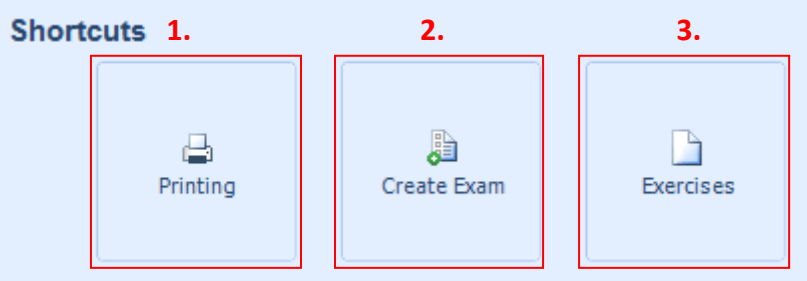


4. The title of education organization shows which school or other type of education institution the user is currently logged into (it is important in cases when one and the same user has been registered in several education institutions).

5. Quick search is a tool, which allows finding quickly the necessary exercise (task), exam or user (see the picture) according to keyword(s) entered. Initially the user selects the search category by clicking on the selected title „Exercises” (to look for exercises, [1]), „Exams” (to look for exams, [2]), „Users” (to look for users, [3]), enters the keyword(s) or just a part of the word in the blank field [4] and clicks „Search” [5]. The search results (if there are any) will appear in a new window. In case there will be no search results the notice saying: „Nothing was found” will appear.

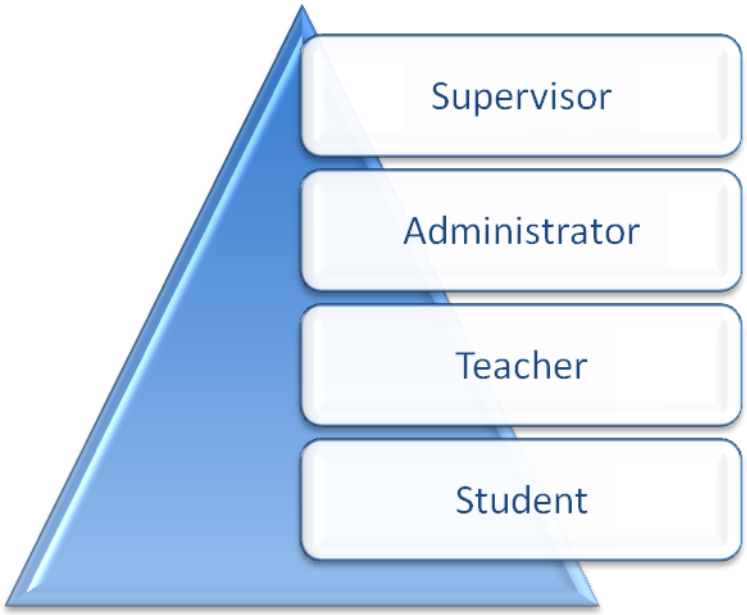


6. Shortcuts perform the functions of quick links. By clicking on “Printing” [1] the Printing wizard will open (see Theme 16). By clicking on “Create exam” [2] Exam creation wizard will open (see Theme 17). When clicking on „Exercises” [3] subject and exercise menu will open.



Theme 3: User roles – Supervisor, Administrator, Teacher, Student

GenExis system has several user roles, which fall within a particular hierarchical system. Within one educational institution there can be users with the following user roles: Supervisor, Administrator, Teacher and Student. Hierarchically these roles can be displayed in the following way:



Each of these roles has both, general and specific features, wherewith it means that depending on their roles, the users can take advantage of different functions. Let`s shortly take a look at 3 main user groups. Supervisor and Administrator (uniting both in one group but pointing at the main differences), Teachers and Students.

Supervisors and Administrators in Educational Organization

The main difference between Supervisor and Administrator within one educational organization is that the Supervisors can create a new administrator for an educational organization to which they belong, as well as, as delete it (administrator is not able to perform this function). All the other functions are quite similar for both user roles:

- Both, the supervisor and the administrator can create new educational sub organizations (if it is allowed in settings of the selected organization);
- Both, the supervisor and the administrator can edit the settings of educational sub organizations ,as well as, delete them;
- Both, the supervisor and the administrator can edit the subject licenses of educational sub organization;
- Both, the supervisor and the administrator can create new user groups and new users within their educational institution (accordingly the supervisor can create new administrators, teachers and students but the administrator – new teachers and students)

and sub organizations (including supervisors and administrators);

- Both, the supervisor and the administrator can assign user licenses and manage user subject licenses and permissions;
- As well as to access the educational content for which they have been granted permissions to, create exams, printouts etc.

Teachers have access to the following functions in the system:

- The teacher can grant/take away subject permissions to students (only those permissions for the subjects in the educational organization that both the teacher and the student have been given the access to);
- The teacher can partly edit students` personal information: change e-mail, name, surname etc.
- The teacher can access and use educational content for which he/she has been given permission;
- The teacher can create exams, printouts, check and edit exam results;
- The teacher can view information of other users (other teachers, administrators) but is not allowed to edit it.

Students have access to the following functions in the system:

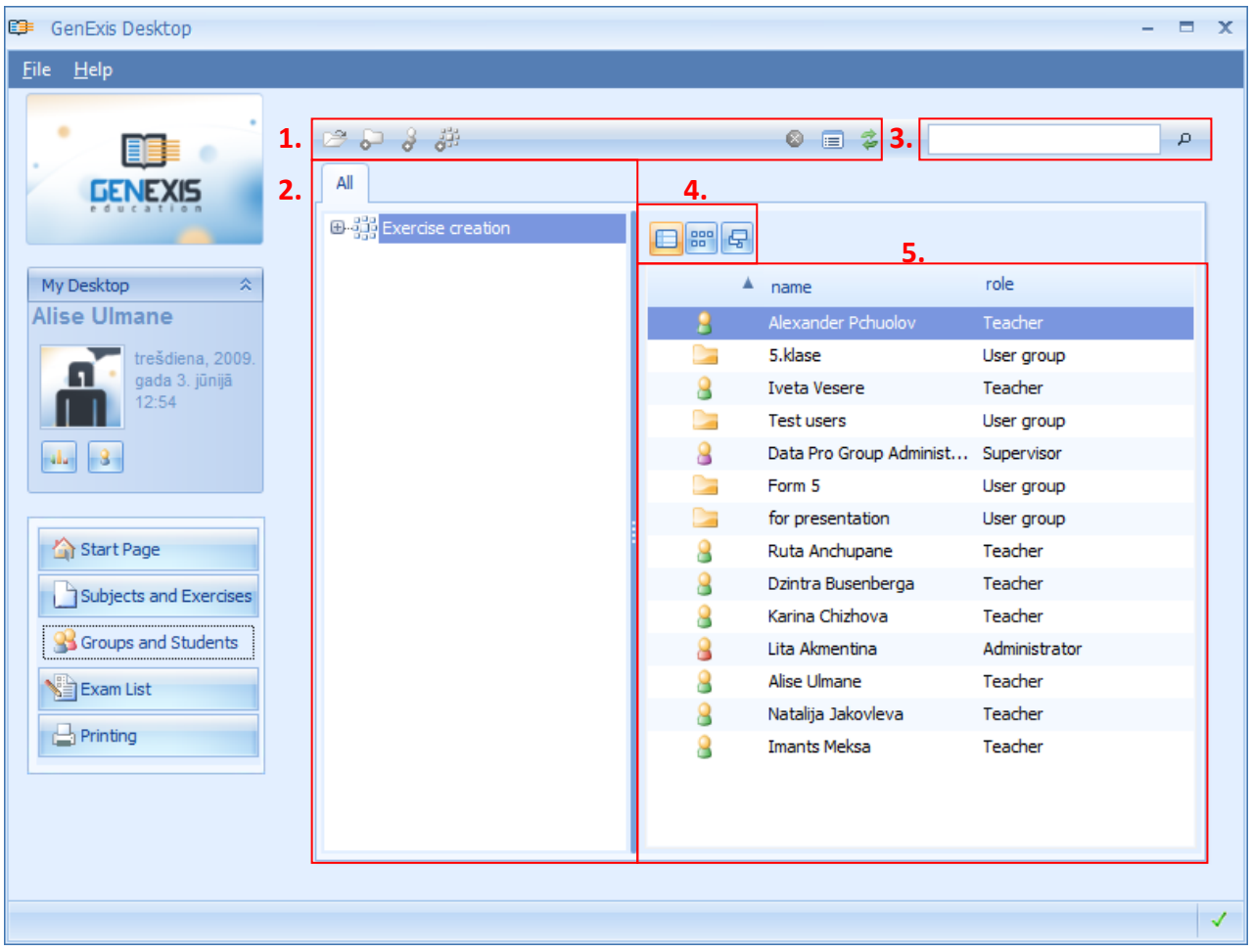
- Students can edit personal information (name, surname, add a photo etc.) and change the password;
- Students can view their personal statistics;
- Students can get access to educational content for which they have been granted permissions as well as they can access the exams planned for them.

Additionally, if the users have been given an ECW license then it gives them a possibility to create education content (exercises) regardless the role. With the only exception being the Students who are able to create exercises if they have been given the ECW license but is not permitted to delete them.

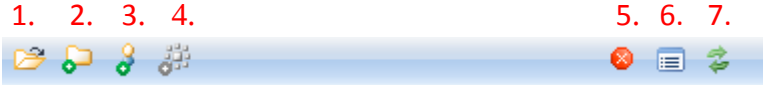
Note: one user can have different roles in one particular or different educational organizations; depending on the role the user has logged into the system he/she will have access to different functions.

Theme 4: How to create a new user group?

New user group can be created by Administrator or Supervisor. By using the Menu on the left side (see Theme 2) open up the menu for educational organization group and users (by clicking on "Groups and Students"). The menu is formed of toolbar [1], section „All" [2], which displays the whole hierarchical system of particular educational suborganization and/or user groups, the list of suborganizations, user groups and users [5], search tool [3], as well as icons which allow to change the list view options [4] (see the picture).

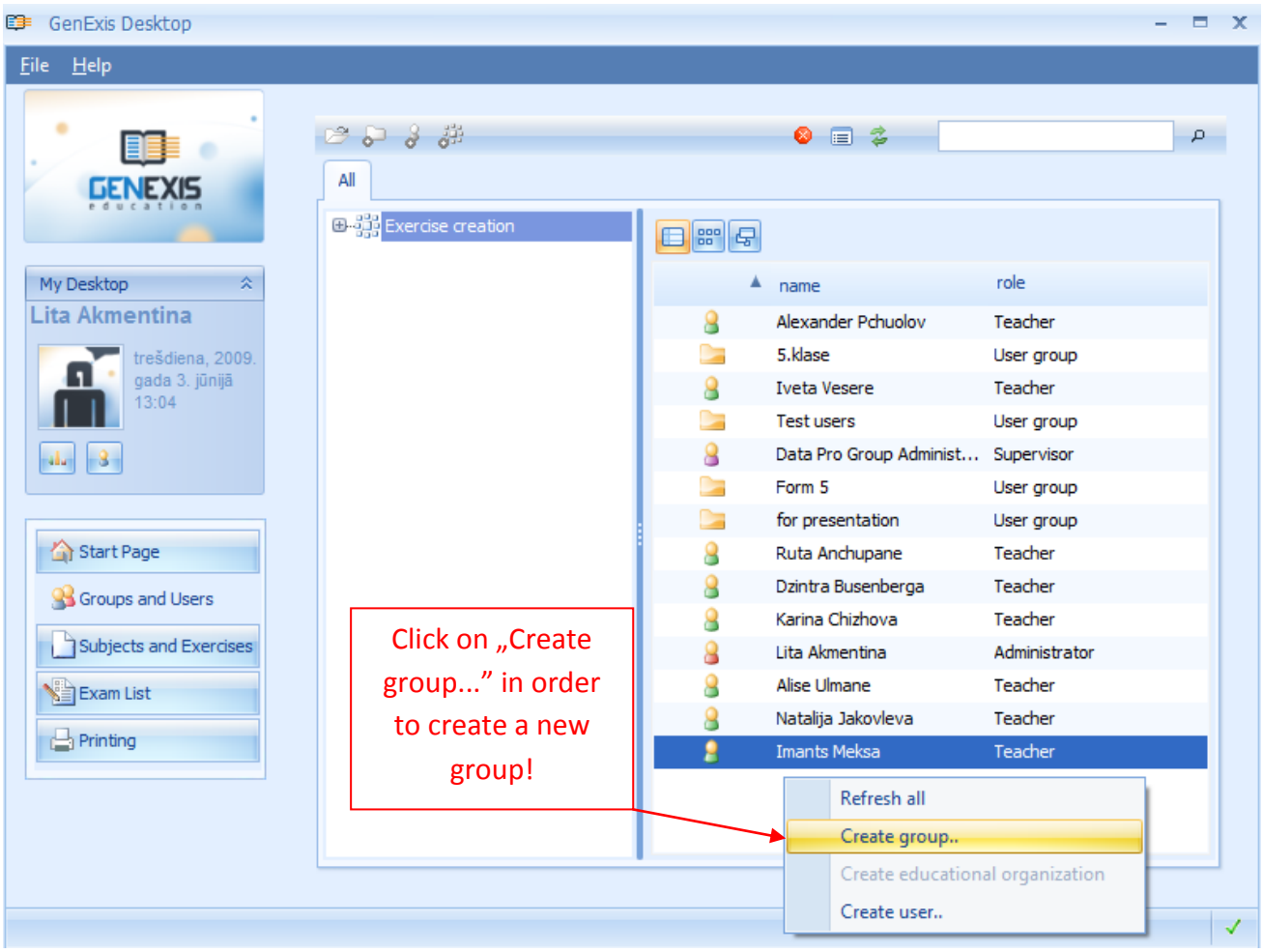


The toolbar is formed of a row of icons, each of them performing a separate function. If the icon is grey then at the moment it is not active and the user is not able to use it.

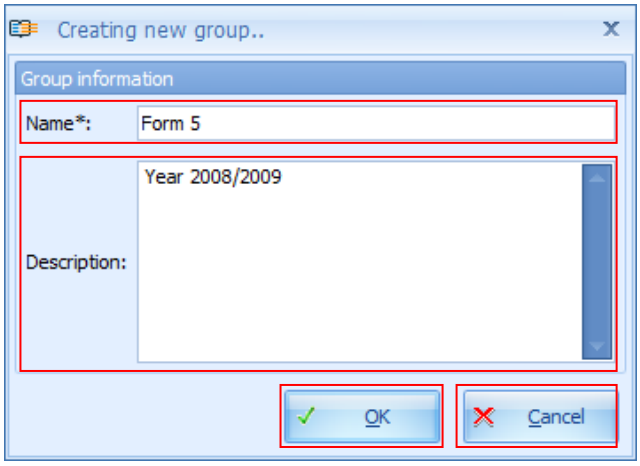


Accordingly, the icons perform the following functions: opens up the content of educational organizations or user group – and expands it [1], starts creating a new user group [2], starts creating new user [3], starts creating new education organization [4], deletes [5], opens settings [6], refreshes [7]. In this case the icon No.4 is non-active, wherewith it is not possible to create a new education organization.

In order to create a new user group, click right mouse button in the blank field of the user list and select “Create group...” (see the picture) from the menu options.

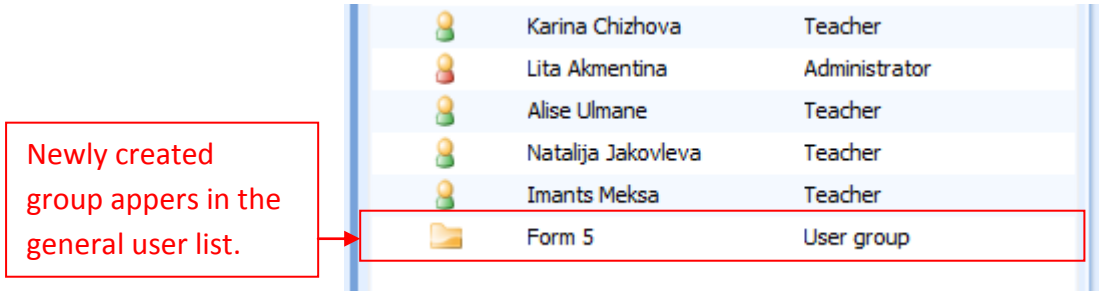


In the same way the users can select the educational organization or already existing user group to which they would like to create a subgroup (by finding it in the list of all educational organizations, user groups and users), and click on the second icon – create a new user group or click right mouse button and select „Create subgroup...”. The user group will be created within the selected educational organization or user group. Sequentially the information form (see the picture) will be opened, which allows entering the name for the selected group (compulsory) and description (optional), which allows viewing all the necessary additional information (see the picture).



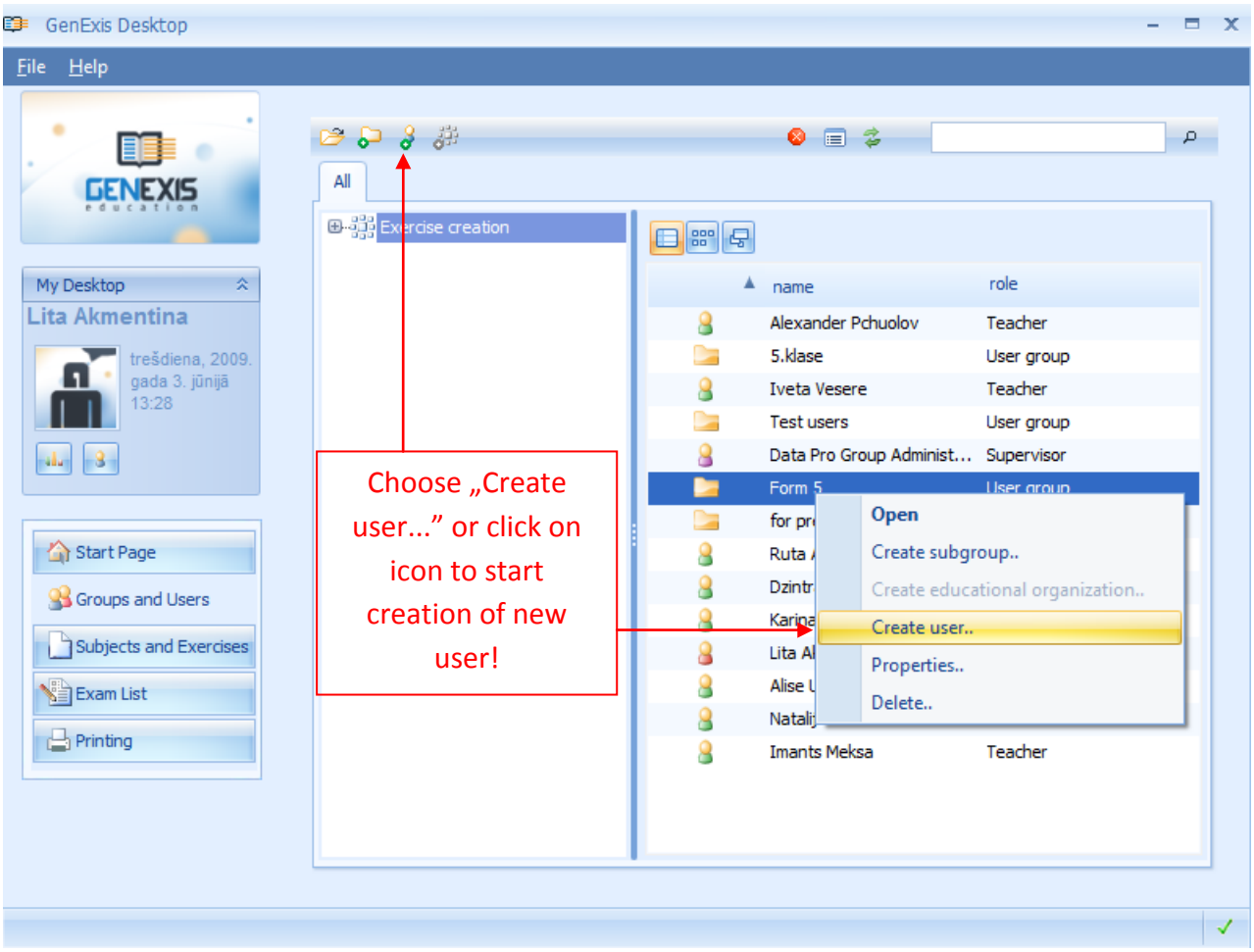
When you have entered the required information, click „OK” to finish the creation of a new group.

If it is necessary it is possible to stop creation of a new group by clicking “Cancel”. In this case the information will not be saved and a new group will not be created.
As soon as the creation of the new user group is finished this user group will appear in the general list of users (see the picture).

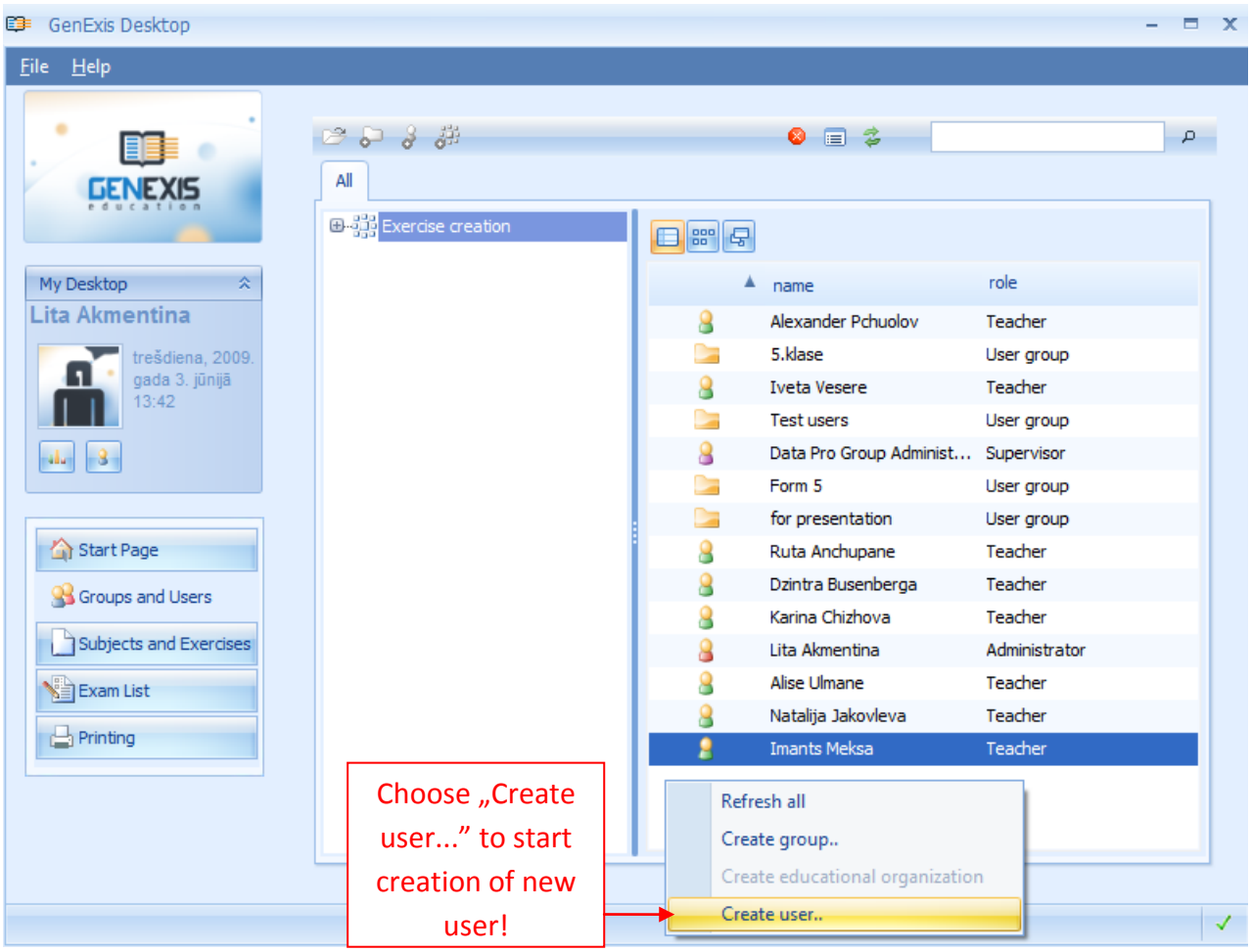


Theme 5: How to create a new user?

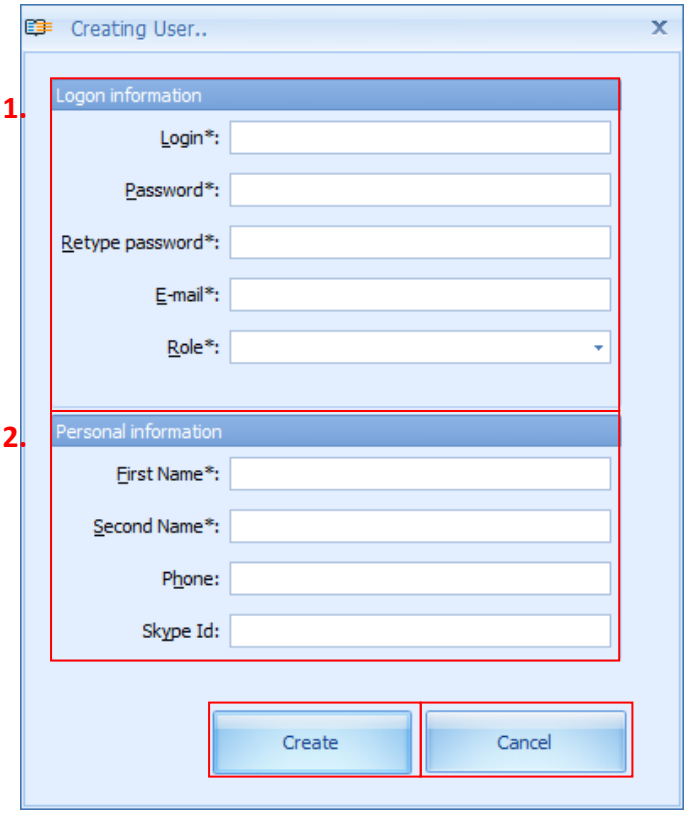
A new user can be created only by Administrator or Supervisor. By using the Menu on the left (see Theme 2) open educational organization's group and user menu (by clicking on „Groups and Students"). Firstly select the place in which the new user will be created (in the educational organization or user group). The particular educational organization or user group can be found in the general hierarchical list of the suborganizations and/or user groups of the particular educational organization (in the section „All"). When the necessary educational institution or user group has been found it has to be selected. Sequently click the icon for creating a new user or click the right mouse button and select „Create user..." from the options.



Alternatively user can expand the user list of the selected educational organization or user group, click the cursor in the blank field underneath the list, then click the right mouse button and select „Create user...” from the given options. In this case the icon will not be usable and non-active.



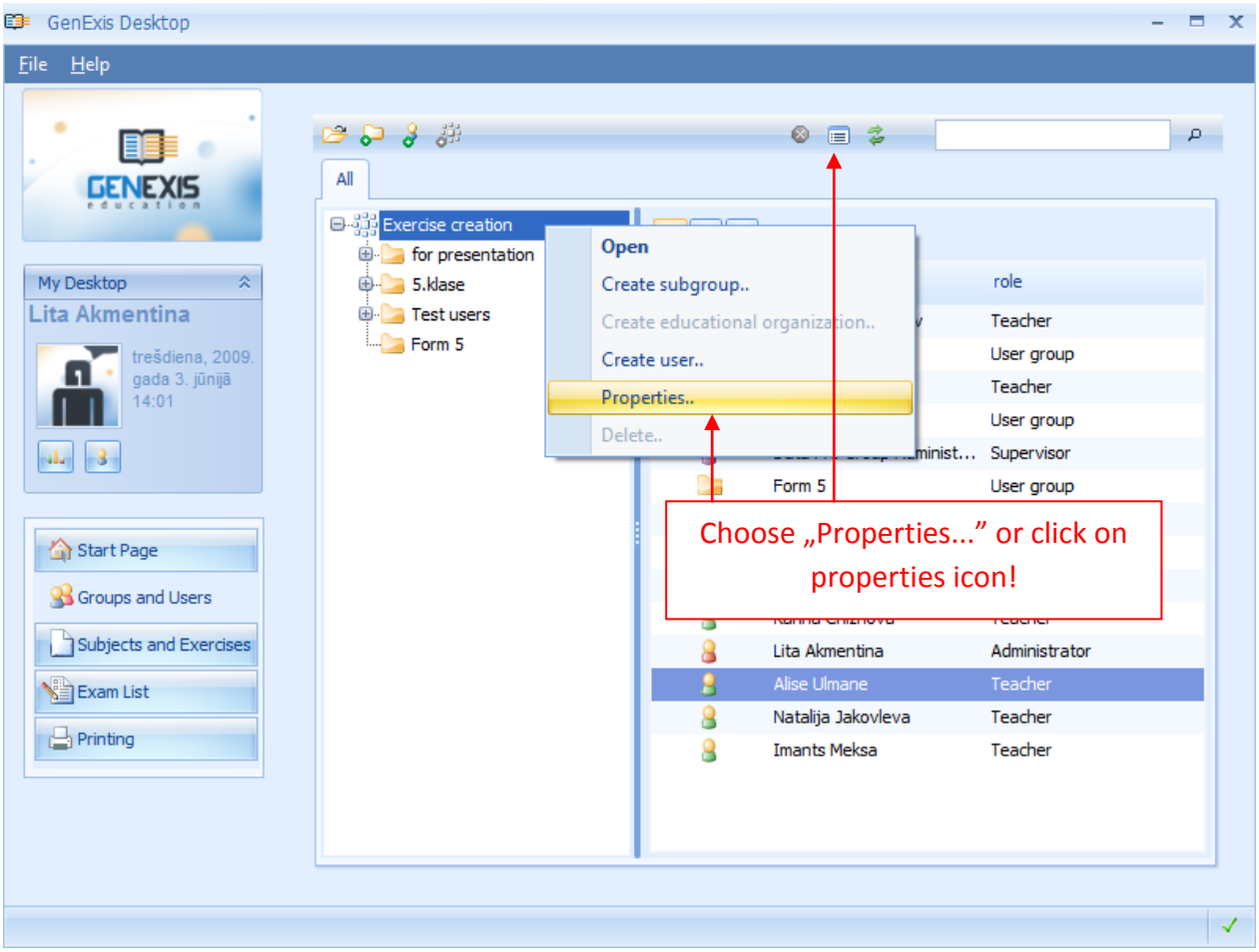
When the function „Create user...” has been activated in one or another way the system will open user form for entering information. In order to create a new user the user identification information [1] and user`s personal information [2] has to be entered. All fields marked with an asterix (*) are mandatory and must be filled in: username; password; retyped password; e-mail (it is essential that the e-mail address is valid); role (has to be chosen out of the given menu); name and surname. Telephone number and Skype ID can be added by choice. When all of the necessary information has been entered, click on “Create” to create a new user. If the user wishes to cancel an action, click on “Cancel” and give a positive answer to the repeated question asked by the system: „Are you sure you want to exit?” **Note:** the system will not allow creating users with matching names or e-mails!



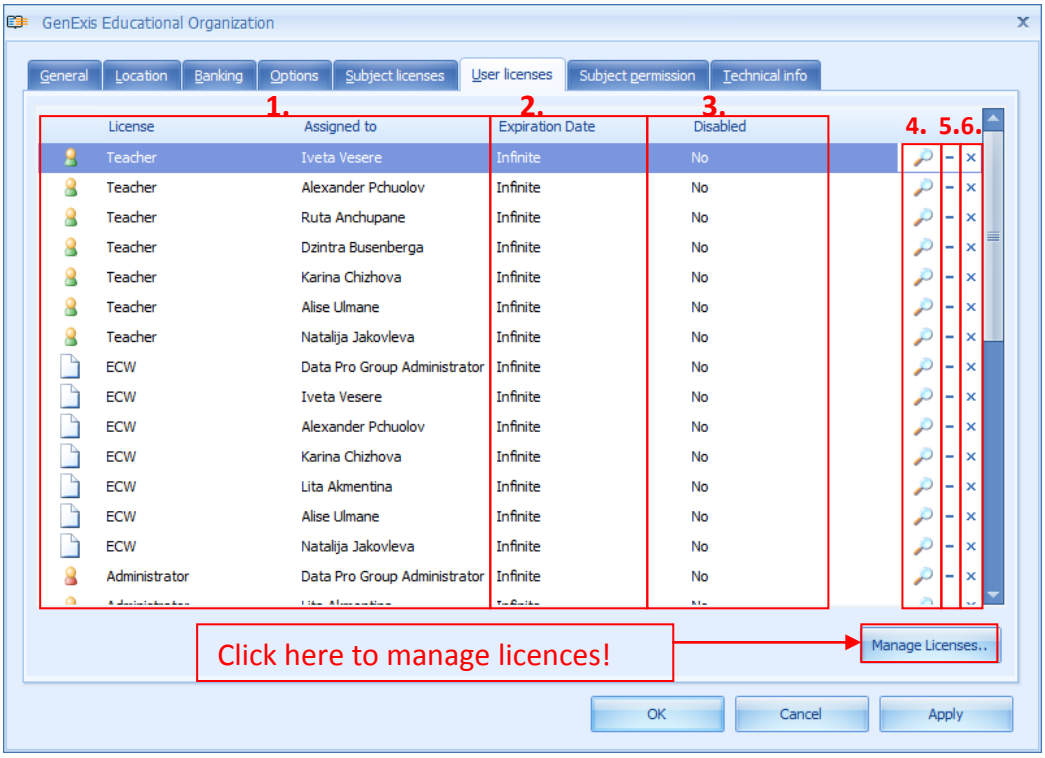
When the button „Create” has been clicked on the system creates a new user and adds it to the general list of users. Wherewith the first stage of creating a new user is finished!

To allow the newly created users to use the system accordingly to the roles they have been given, the corresponding license also has to be assigned. It can be done in two ways: by using properties of education organization or properties of the selected user. In both cases the educational organization has to have available user licenses, otherwise contact your Supervisor.

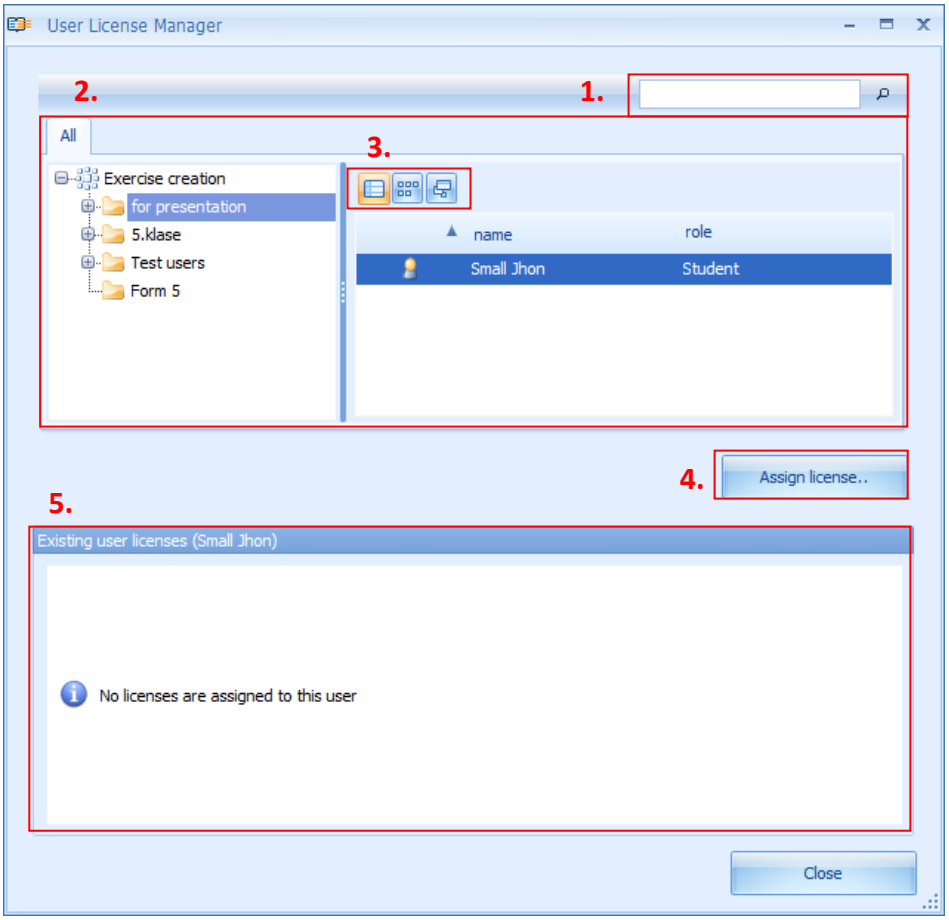
Assigning the license through education institution options: select the particular education organization, click the right mouse button and select „Properties...” or click on properties icon to open the options for this particular educational institution.



Sequentially the menu of properties of the selected educational organization will be opened. Select the section „User licenses”. This section allows to view all licenses that have been assigned to users as well as the available licenses, their type [1], anticipated usage duration [2], whether the license is active[3], as well as quickly view the technical information of the license (license type, to whom is it assigned to, its period of validity and date of last modification, time and by whom it was done) [4], suspend the user`s license (deactivate by clicking on „-„, or activate by clicking on „+”) [5] or delete it [6].

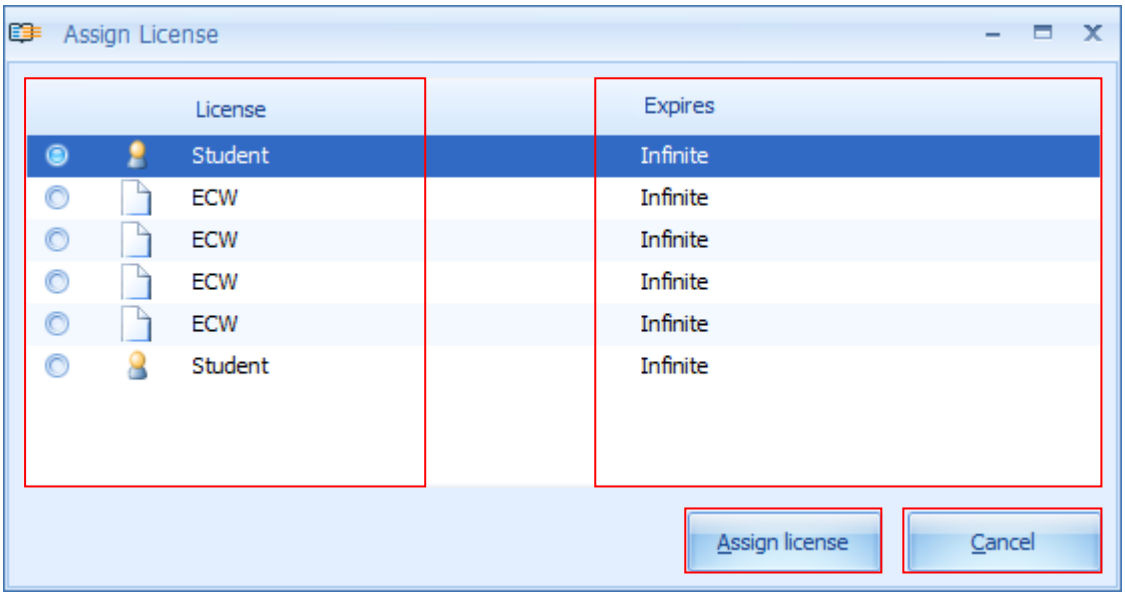


In order to manage licenses (assign new license to a user etc.) click on „Manage Licenses...". Sequentially the user license manager will be opened.



This manager allows finding any particular user by using the search tool (enter the corresponding search criteria – syllable or word(s) and click the magnifier symbol, the search results will appear in a separate window) [1] or educational organization, user group or user list [2], as well as making the desired changes in the list design by using icons [3]. When the necessary user is found, select it and check the window below [5] - the list of licenses assigned to the user or a note saying „No licenses are assigned to this user" in the case when the user has no assigned licenses will appear. To assign a new license, select the user and click on „Assign license..." [4].

The system will open a new window showing all currently available licenses in the particular educational organization as well as license validation period. In order to assign any of these licenses to the user, select it and click on „Assign license".

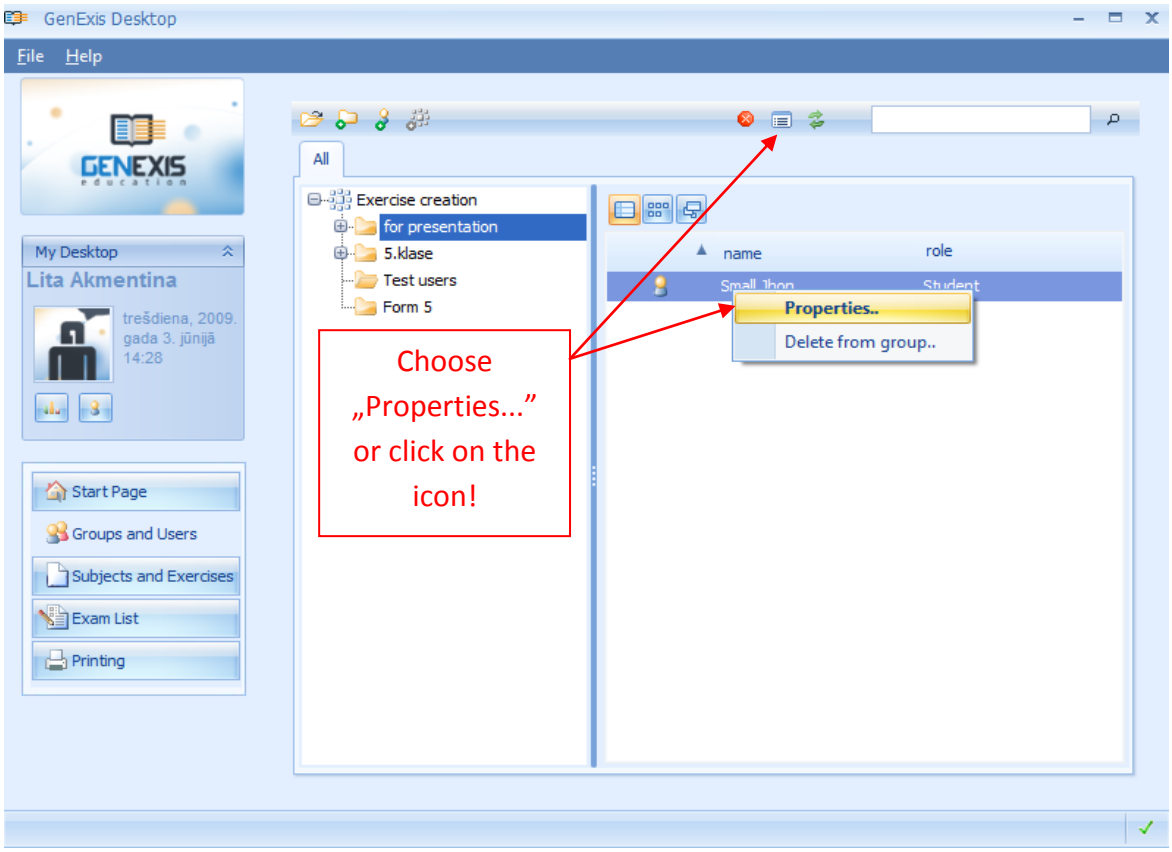


If you wish to stop the activity, click „Cancel". If you wish to assign one more license to this user, the previously mentioned action has to be repeated. When the new license is assigned it immediately appears in the user`s license list.

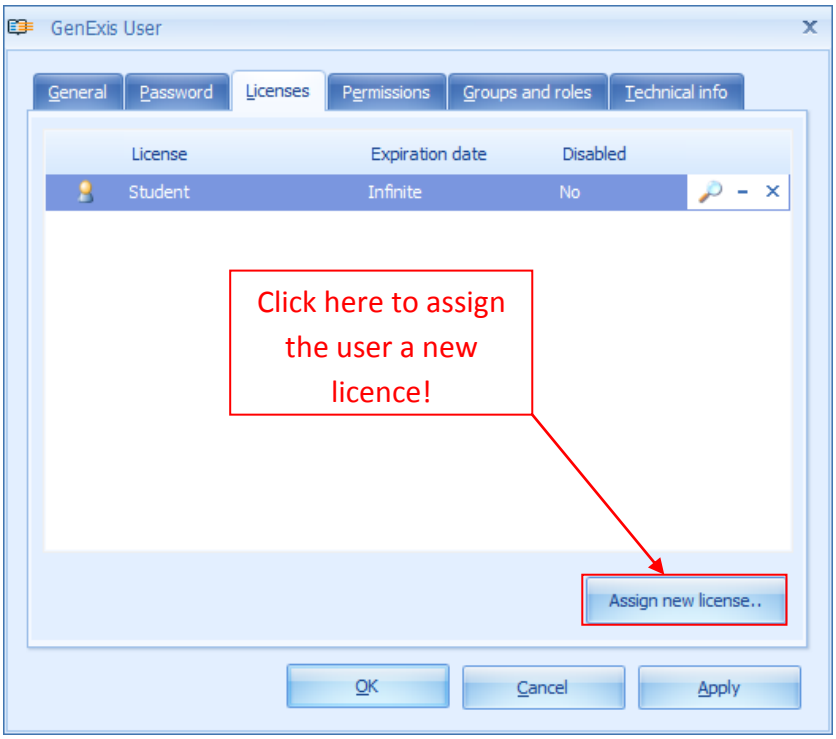
It is also possible to quickly view the technical information of licenses assigned (type of licenses, to whom it is assigned, its validation period and last modification date, time and by whom was it done) through the license manager, suspend the user`s license (deactivate by clicking on „-„, or activate by clicking on „+") or delete it (like it was in the user license menu section in the education institution properties).

When the work with user licenses is finished, click „Close" to close the menu. **Note:** In order to close the education institution settings, click „OK", thus it is possible to manage licenses of all users of the selected education organization with the help of a single menu!

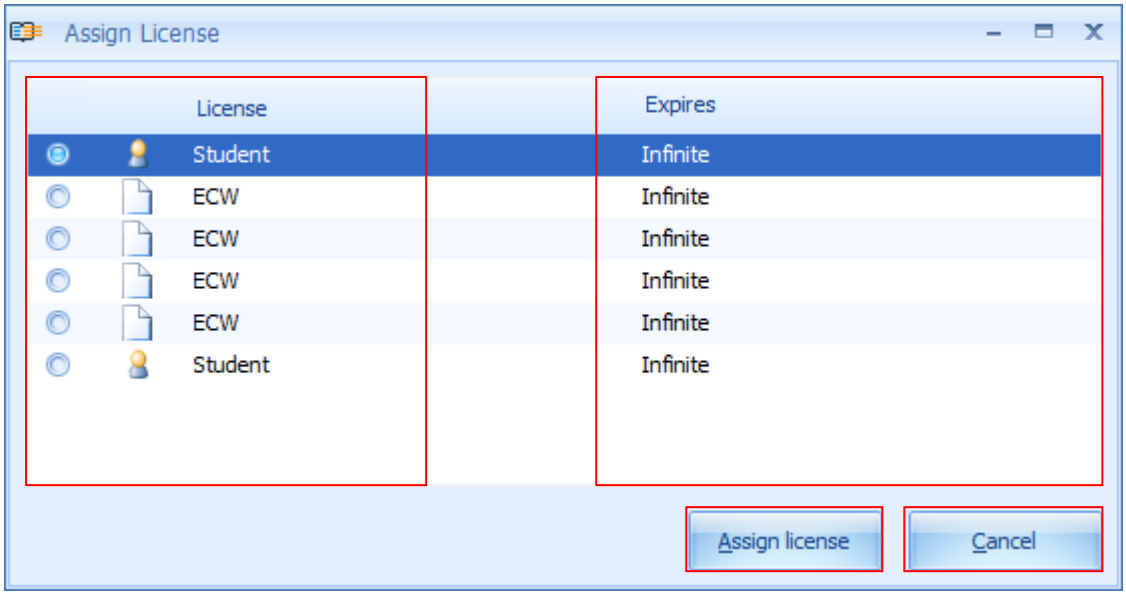
Assigning the license through user settings: open the section „Groups and Users”, select or find the user to whom you wish to assign the license to. Mark the selected user and click the right mouse button and select „Properties...” out of the given options or click on settings icon.



Sequentially the user settings window will be opened. Open the section „Licenses”:



If the user has no license assigned then the list is empty. To assign a license to the user, click „Assign new license...”. The system will open a new window, which will display all available licenses at the current moment for the selected educational institution as well as the validation period of the licenses.



In order to assign the user any of these licenses, select it and click on „Assign license”. If you want to stop this action, click „Cancel”. If you want to assign one more licenses to the user, the previously described action has to be repeated.

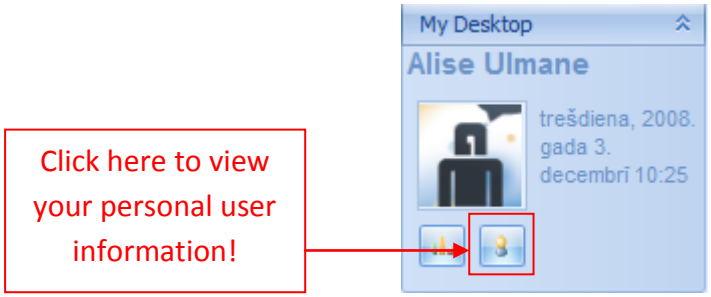
When the user will be assigned a new license it will immediately appear in the license list. When you have assigned all the anticipated licenses to the selected user, click „OK” to close the user information window.

Note: the newly created users` roles have to match the license assigned to them, namely, the Student`s role needs to be supported by a Student`s license, Teacher`s role – Teacher`s etc. In the opposite case the user will not be able to log in to GenExis system and use it!

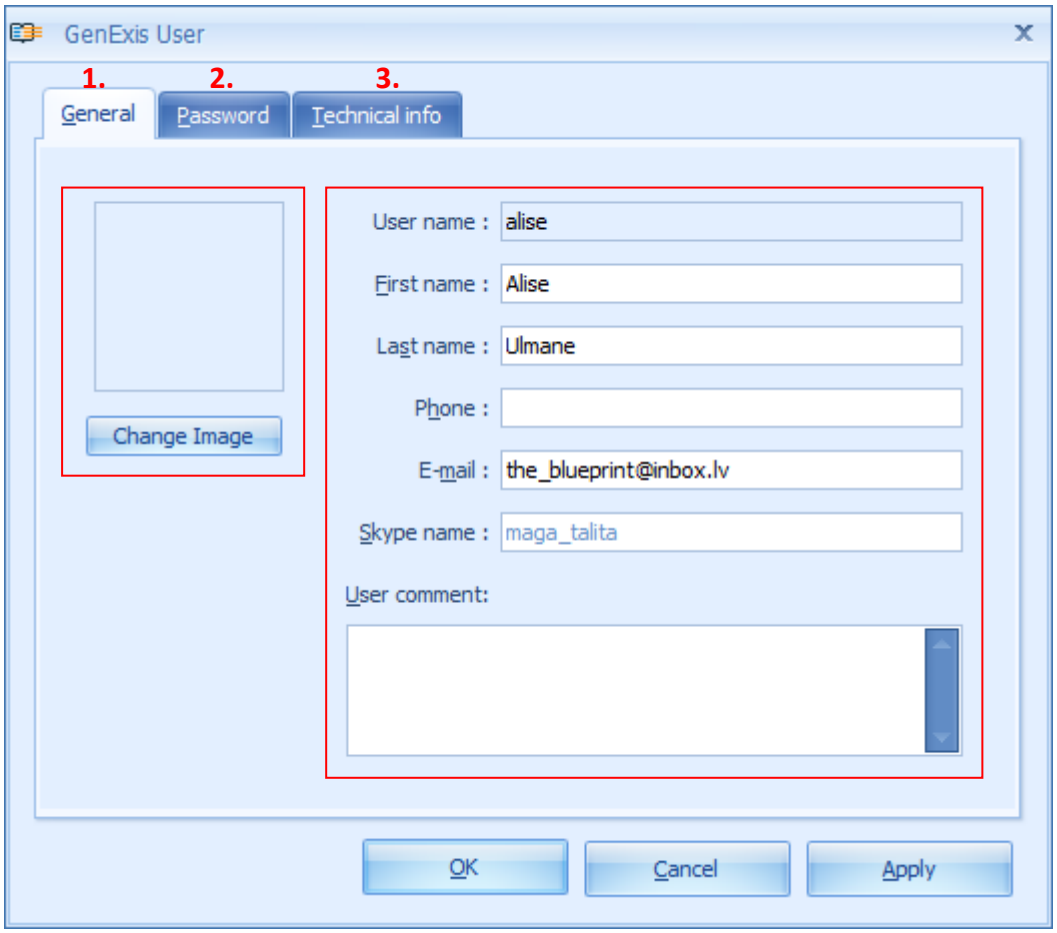
When the users have their user licenses assigned to them, they can log in to GenExis system but they won`t be allowed to access the available educational content until the permissions for this won`t be granted. The teachers are able to grant permissions for students to the study subjects available to them. More detailed subject permission assignation order is described in Theme 6 on Users` personal information.

Theme 6: User's personal information

In order to view one`s personal information click on user information icon (see the picture), which is to be found in the desktop section: Information on user and date (see Theme 2).



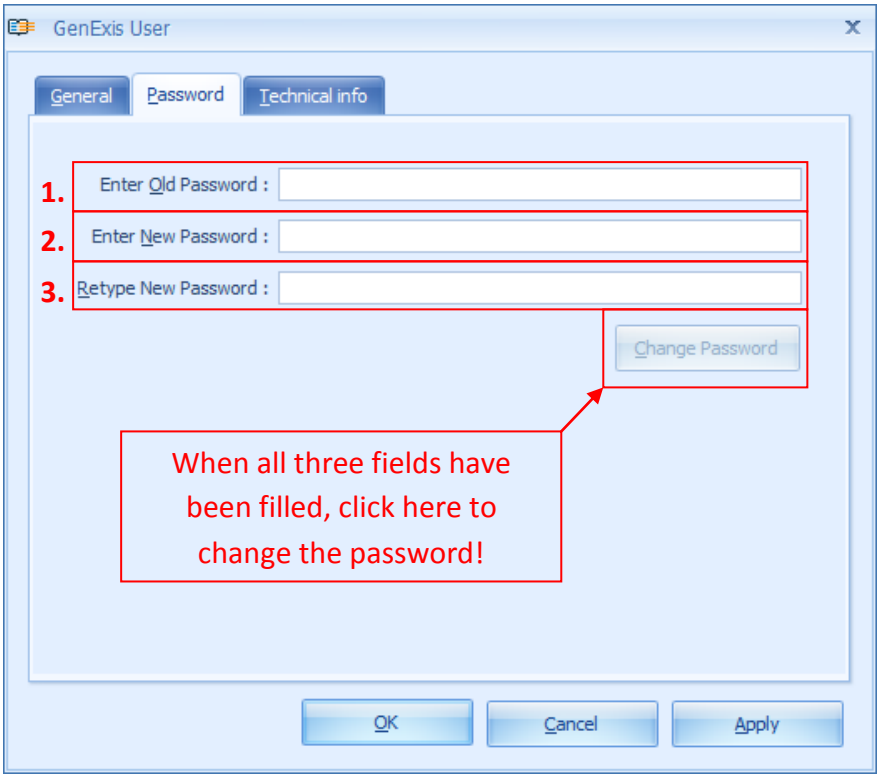
By clicking on user information icon the window with user`s personal information will be opened (see the picture). It consists of three sections: „General" [1], „Password" [2] and „Technical information" [3].



In the section „General" the users can edit general information about them: change image (by clicking on „Change Image" the users will be offered an option to add image from the computer`s memory), username, name, surname, telephone number, e-mail, Skype ID as well as add extra

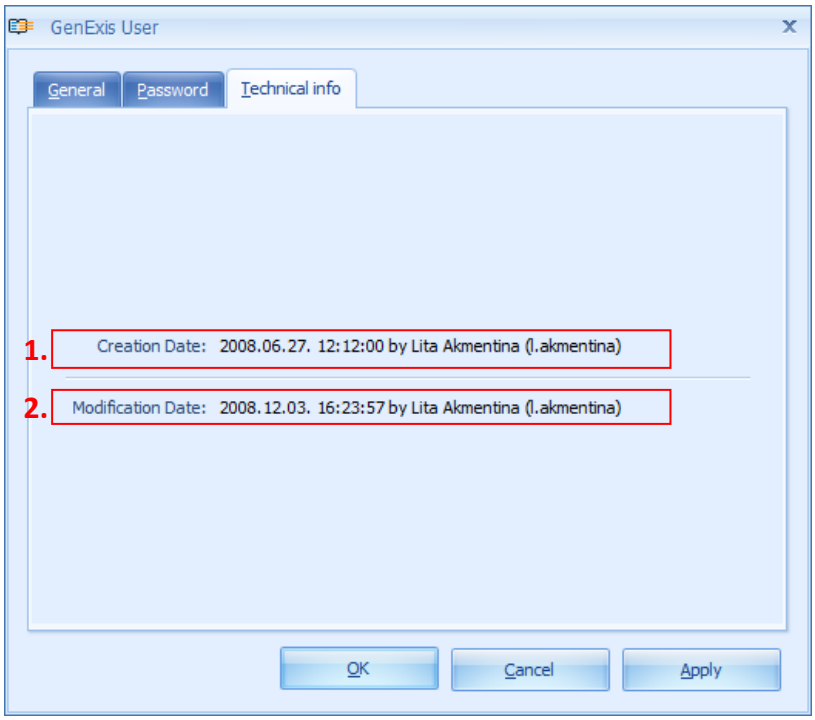
information in the section “User`s comments”. In order to save changes click on „Apply” (the information will be saved to the system and you will be able to proceed editing your personal information in the opened window) or „OK” (the information will be saved to the system and the opened personal information window will be closed). If you don`t want to save the changes made then click „Cancel” – the information will not be saved and the opened personal information window will be closed.

In the section „Password” it is possible to change user`s password. Enter your old password [1], write in the new password [2] repeat the new password [3]. When all three fields are completed, click “Change Password”.

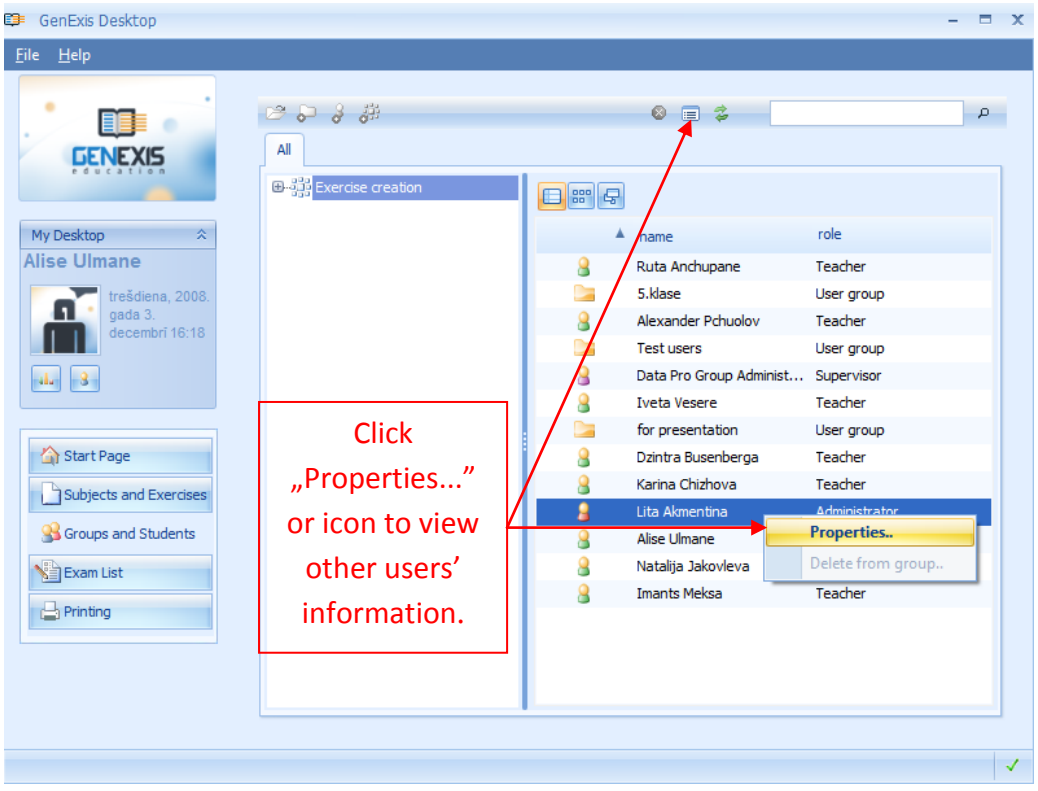


Note: the password has to be at least 6 symbols long, otherwise the system will not allow changing it! If the password has been successfully changed the notification „Password was successfully changed” will appear.” Now click on “OK” to finish this action (see the picture).

The section „Technical information" includes information on who and when has created your user account [1] and when and who has last modified your user account [2]. This information is not editable.

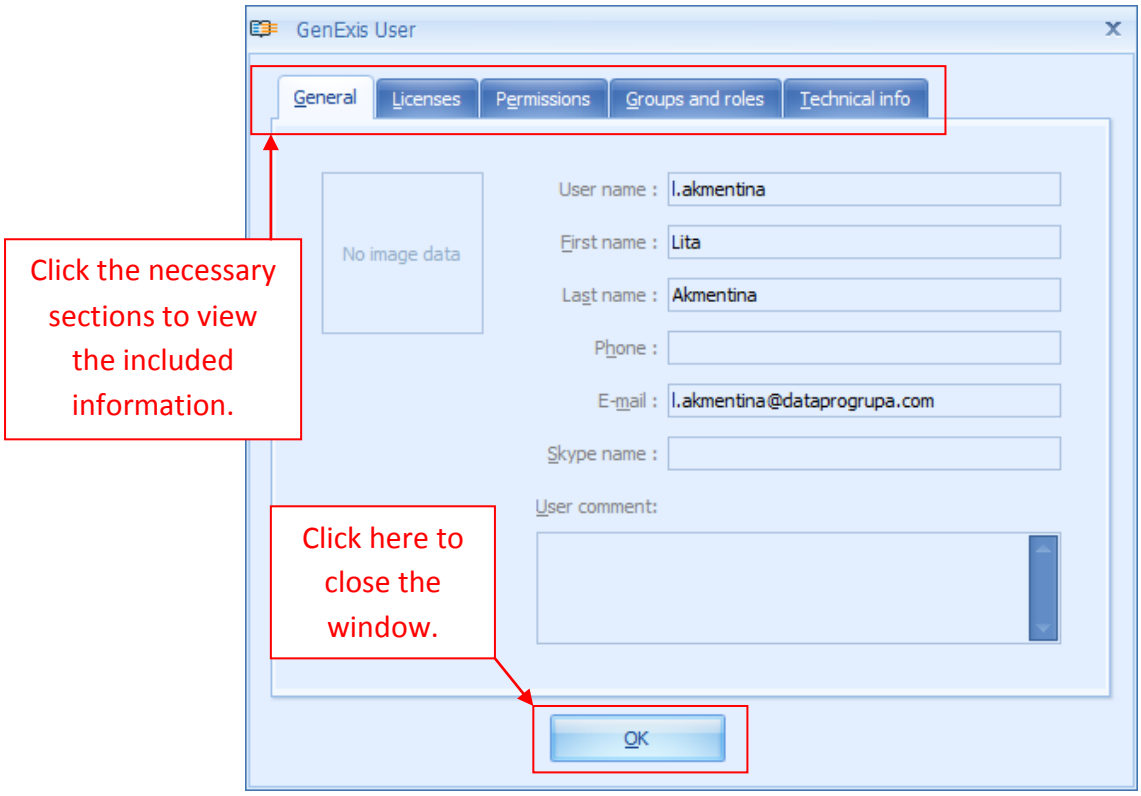


Personal information of other users: The teacher has the option to view (administrator's; other teachers') information and to partially edit (students') information. To view other users' information the user has to open "Groups and students" (See Theme 2), then select the user whose



information they wish to view, click the right mouse button and then select “Properties” (see the picture). The alternative is to click on the icon which opens the properties (the 6th icon in the tool bar).

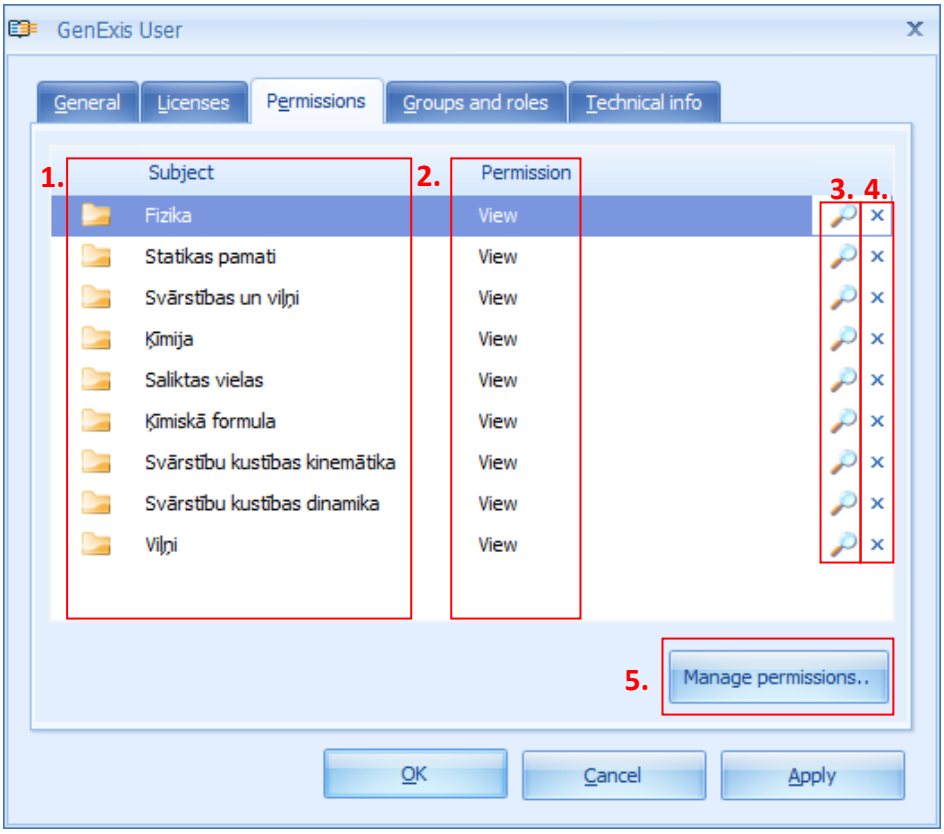
In case of administrator or other teacher’s user account the system will open a window with selected user’s information which is viewable but not editable.



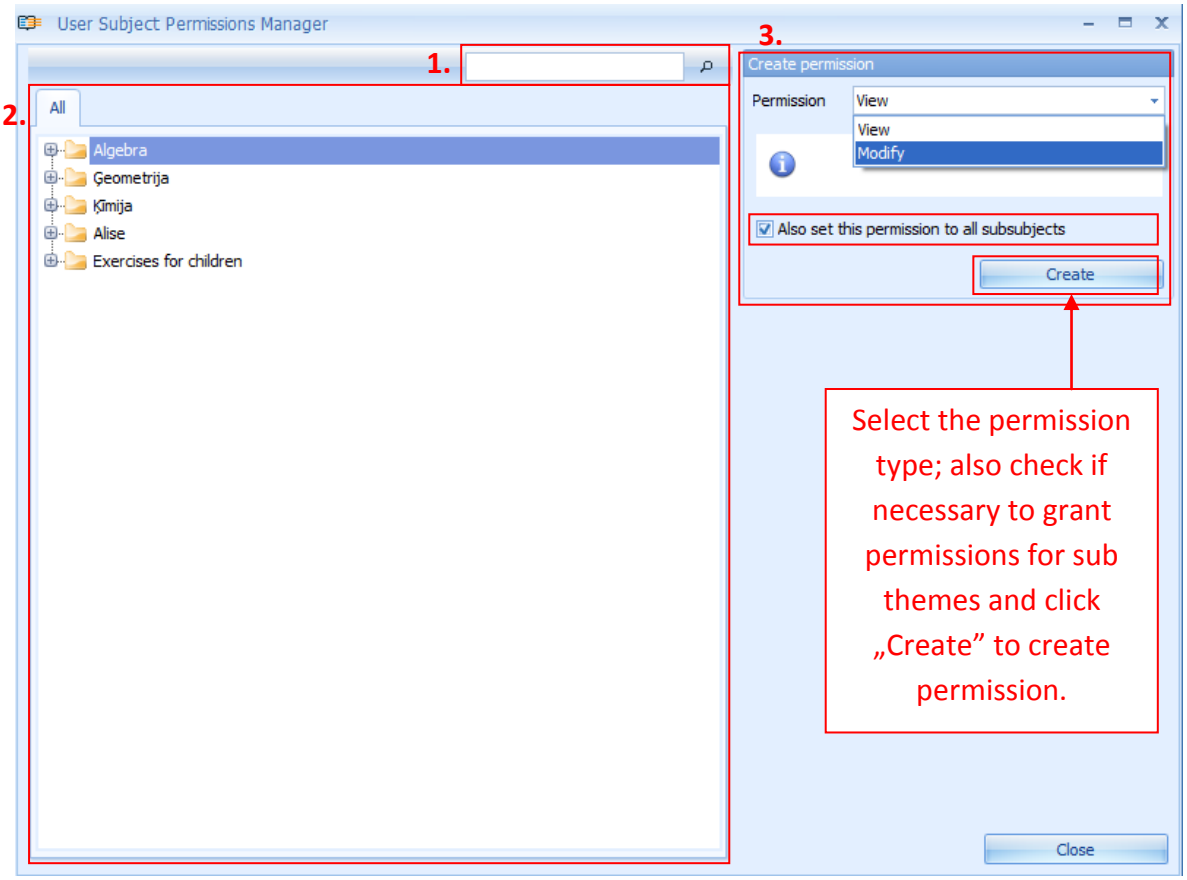
The user’s general information (picture, user name, name and last name, contacts and other information that the viewer has considered important to share) is found in the section “General”, the section “Licenses” includes the user’s licenses (what licenses the selected user has in the educational organization), the section “Permissions” consists of information on permissions (which permissions – in which subjects and what kind - the selected user has in the educational organization), the section “Groups and roles” shows information on groups and roles (in which groups the user has registered and what role they have in each of these organizations), and the section “Technical information” includes technical information (information on when and who has created the selected user and who was the last to modify this users’ information). To close this window, click “OK”.

Students' personal information: The teacher has access to viewing all the previously mentioned information on students as well. The teacher has the right to partially edit the students' user information. The teacher has the rights to edit the student's user information in the section "General" – here the teacher can edit the student's name, last name, phone number, e-mail address and Skype ID, as well as to add comments (the teacher doesn't have access to editing the username or the picture). The teacher also has access to edit the student's user information in the section "Permissions".

By opening the section "Permissions" the teacher can view which subject permissions the student has (see the picture) – which subjects [1] and what type of permissions [2]. The teacher can also access the technical information of the permissions (information on the permission and the permission license) [3] and is allowed to simply erase the subject's permission by using the "x" at the end of the row [4]. The teacher can also grant the students new permissions to subjects. In order to do that, click on "Manage permissions…" [5].



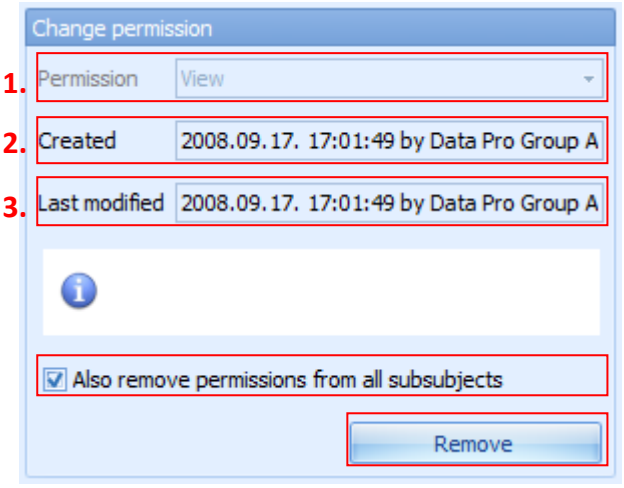
By clicking “Manage permissions…” the system opens the User Subject Permissions Manager in a new window (see the picture). The User Subject Permissions Manager includes search [1] by using which it is possible to quickly find the necessary subject or theme for which the teacher wishes to grant the student a permission; the list of themes and subthemes to which the teacher can grant permissions (section “All” [2]) and which offers a simple detection of the necessary subject/ theme and to see the subject hierarchy, as well as tool for creating permissions [3].



If the teacher wishes to grant the student permission to one of the subjects they must firstly select a theme and find it in the theme tree. If the teacher wishes to grant the student permission to one of the main themes then in order for the student to be able to work with the subthemes and exercises included in this section, the teacher must acknowledge (by checking the section” Also set this permission to all subthemes”) that they wish to grant the student access and permissions to all the subthemes. **Note:** it’s not possible to grant permission only to certain exercises. This approach allows the teacher to control only the number of subjects which are accessible to the student in the given study period.

When the teacher has chosen the subject / theme / subtheme to which they wish to grant the student permission, they must select the permission type: “View” (the student will be able to use the exercises) or “Modify” (the student will have access to using and editing the exercises). **Note**: in order for the students to be able to use the advantages of the “Modify” permission, they must also have the ECW (exercise creation) user licenses!

When the teacher has chosen the type of permission, they must click on “Create” to create the permission. If the permission is successfully created then the permission creation format is changed to the permission editing format (see the picture) which includes the permission type [1], the permission creation date and time [2] as well as information on who has created the permission and the date and time of the last modification of it [3]. An extra option is to remove the permissions with all the subthemes. This can be done by using “Remove” which allows deleting the selected permission.

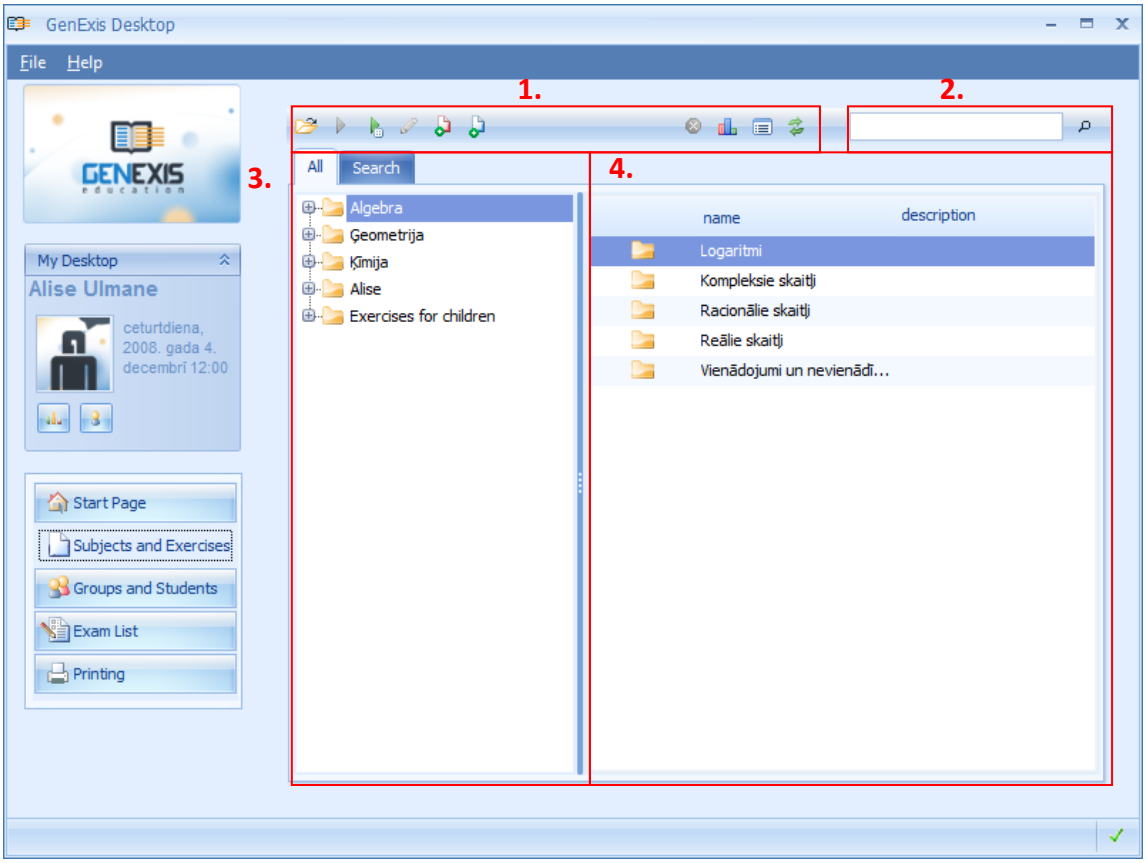


If the user wishes to remove the permission without selecting that permission is removed from all the subthemes, then the permission will be removed only from the selected main theme (thus the student will not see one principal theme folder which includes several other folders with exercises but they will see only the subtheme folders).

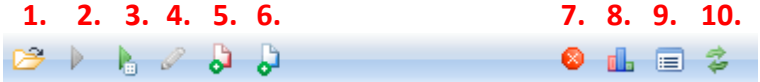
In order to close the User Subject Permissions Manger the user must click “Close”. All the modifications in the User Subject Permissions Manger (created or removed permissions) will appear in the section “Permissions” of the user’s information account. In order to save the modification, the user must click on “Apply” (the information will be saved in the system and the teacher will be able to continue editing the students’ user information in the open window) or selecting “OK” (information will be saved in the system and the open user information window will be closed).

Theme 7: How to create a new study theme/subject?

In order to create a new study theme / subject the user must open the section “Subjects and Exercises” (See Theme 2). In this section the subjects and themes are arranged in a hierarchical system with main subjects (for example, study subjects or main theme blocks within a certain subject) and sub themes (which can be arranged sequentially). The section “All” [3] allows the user to view in the total main subject and sub theme tree in an extended or compact way. The next section [4] allows the user to view the content of the selected theme (the next level of the sub theme or exercises included in the selected theme). The user also has access to the search [2] which allows searching a specific theme by keyword(s) or parts of a word, and the toolbar [1] which is helpful in performing several parts of the process.



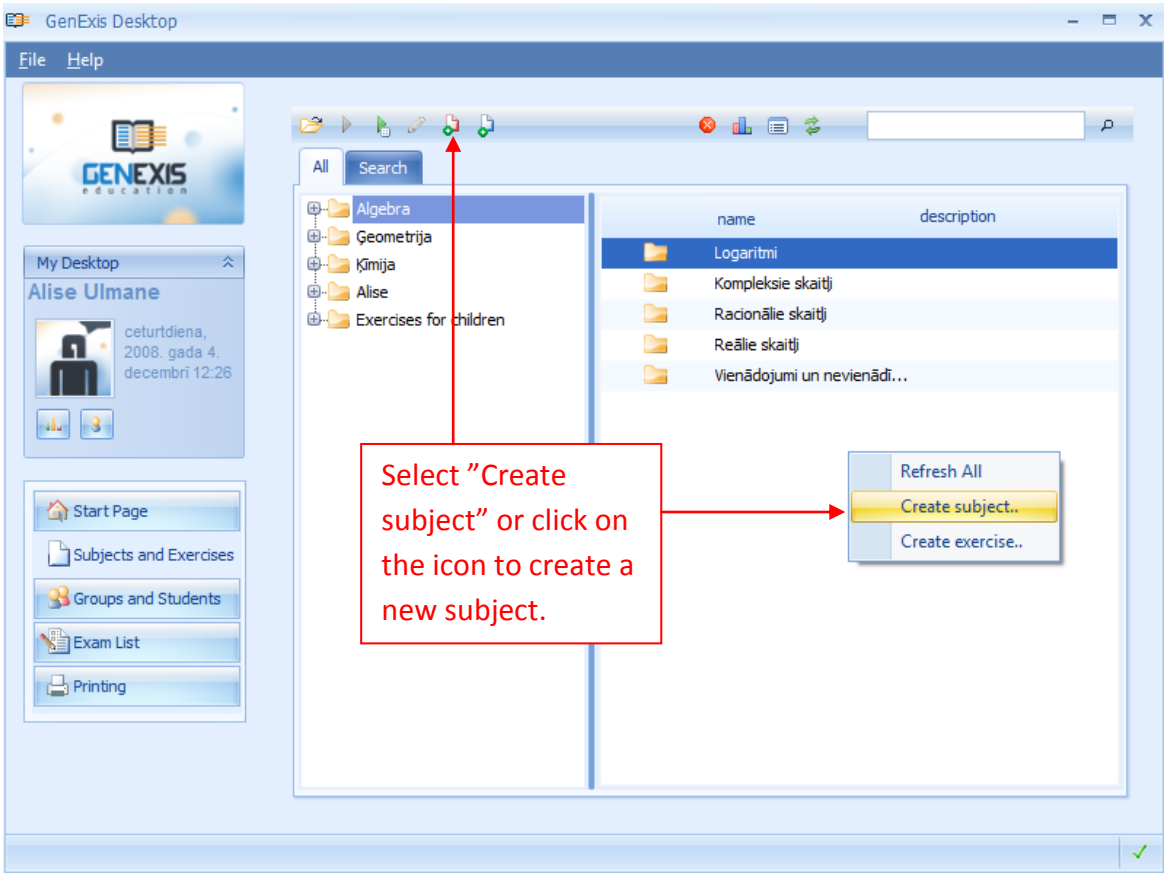
The toolbar consists of a number of icons each of which has a certain function. If the icon is grey it means that it is not active at the moment thus the user cannot use it.



Accordingly, the icons have the following functions: to open a folder [1], to start an exercise [2], to randomly choose and start an exercise from a folder [3], to start editing the context of a folder [4], to start creating a new subject / theme [5], to start creating a new exercise [6], to delete [7], to open the statistics [8], to open the setup [9], to refresh [10]. In this case icons number 2 and 4 are

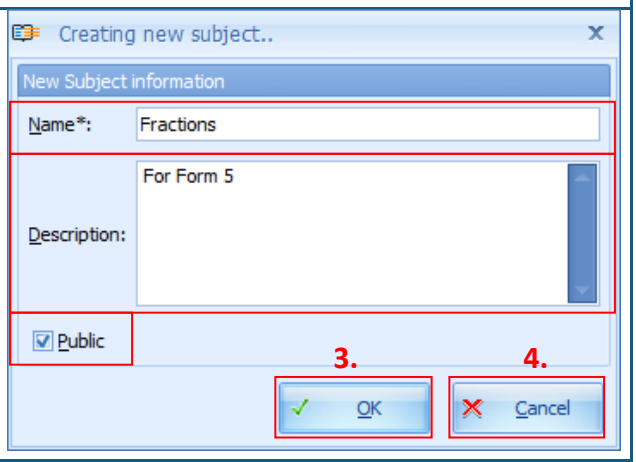
inactive because no exercise is selected thus it cannot be started or edited.

If the user wishes to create a new main subject, click the mouse cursor in the section “All”, press the right mouse button and select “Create subject” from the offered menu. In this case the user can’t use the icon for creating a new subject. But if the user wishes to create a new sub theme they must find the subject (theme) under which they wish to create the sub theme, then select this subject in the subject and theme tree in the section “All” (so that the existing sub themes of this theme if such exist appear in the next window), click the cursor in the free space under the already existing sub themes, press the right mouse button and select “Create subject”. The alternative is for the user to select a theme for which they wish to create a sub theme in any of the offered sections and click on the theme addition icon.

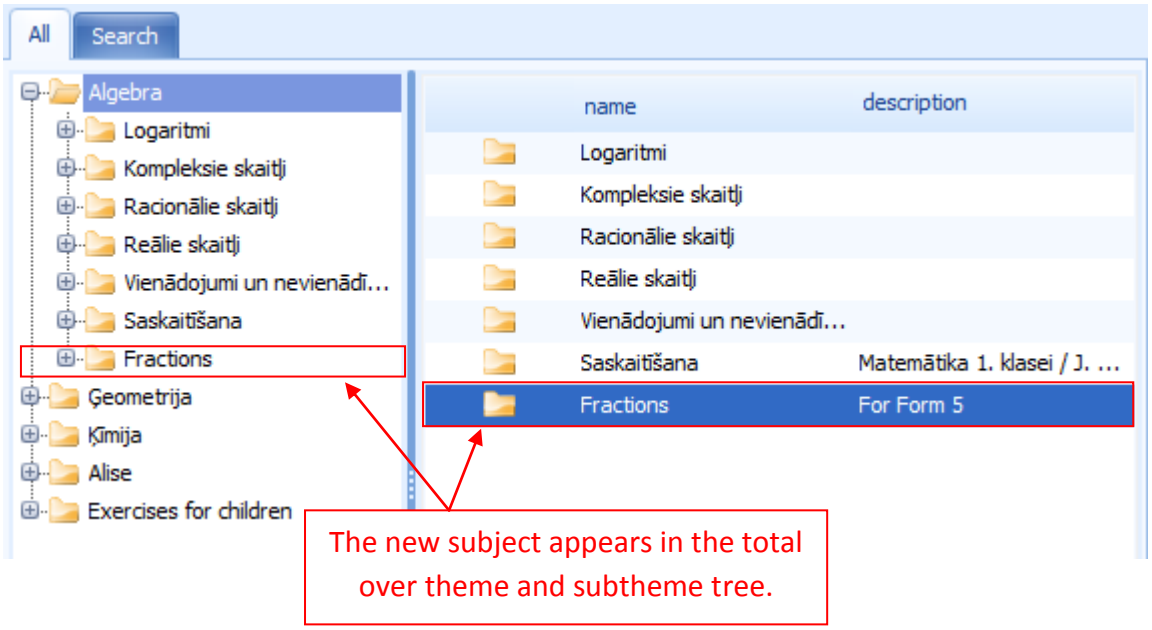


When the new subject information insertion window is opened (see Picture), the user must insert the subject name [1]. The user also can insert the subject description [2] which can include a list of the methodical materials and other information. The user can select to make the given subject public or private.

After inserting the necessary information, click on „OK” [3] to finish creating the new subject. If the user doesn’t want to create a new

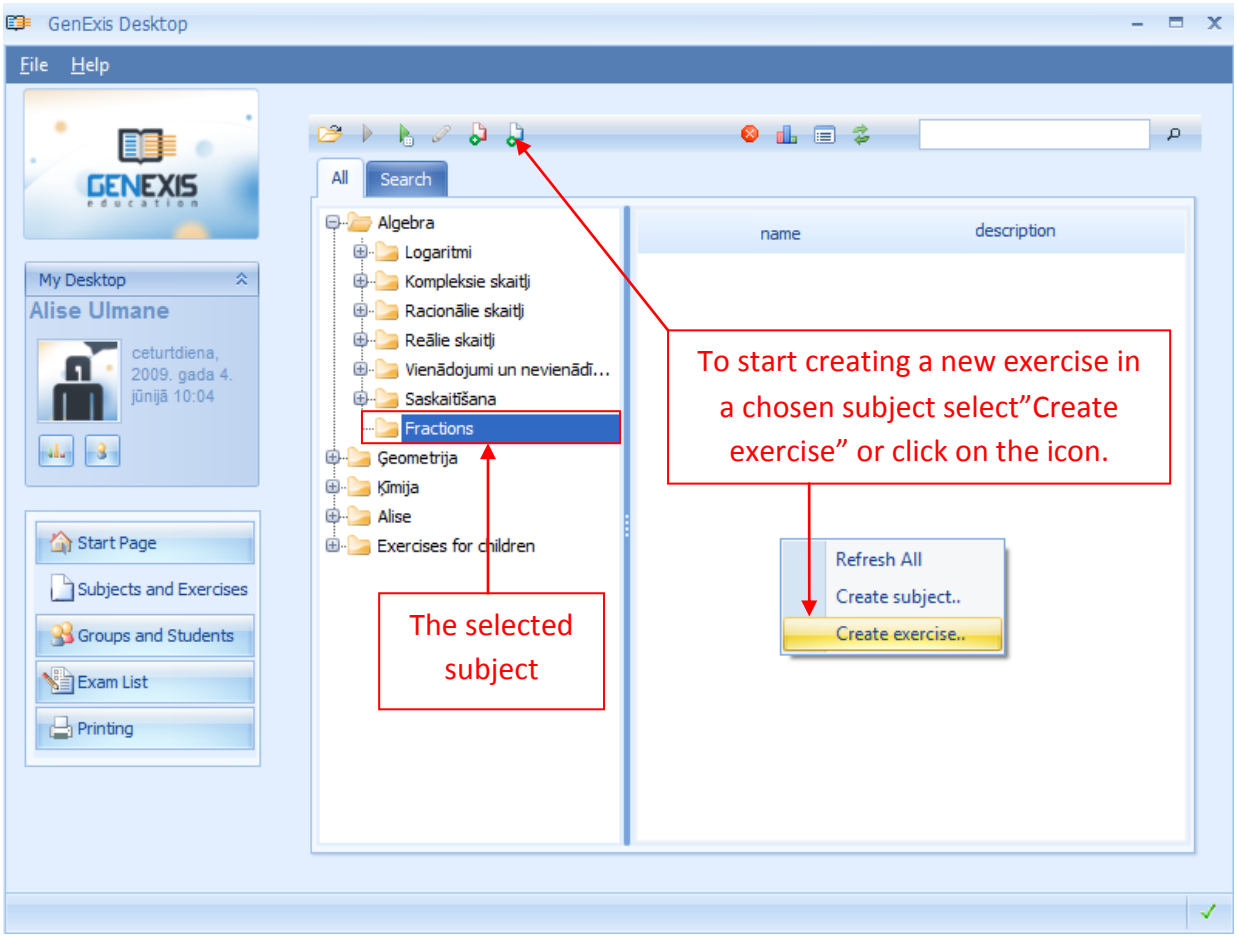


subject they can click on „Cancel” [4] thus cancelling the action.
After clicking on “OK” a new subject information insertion window will be opened and the new subject will appear in the total tree of the subjects and themes (see picture).



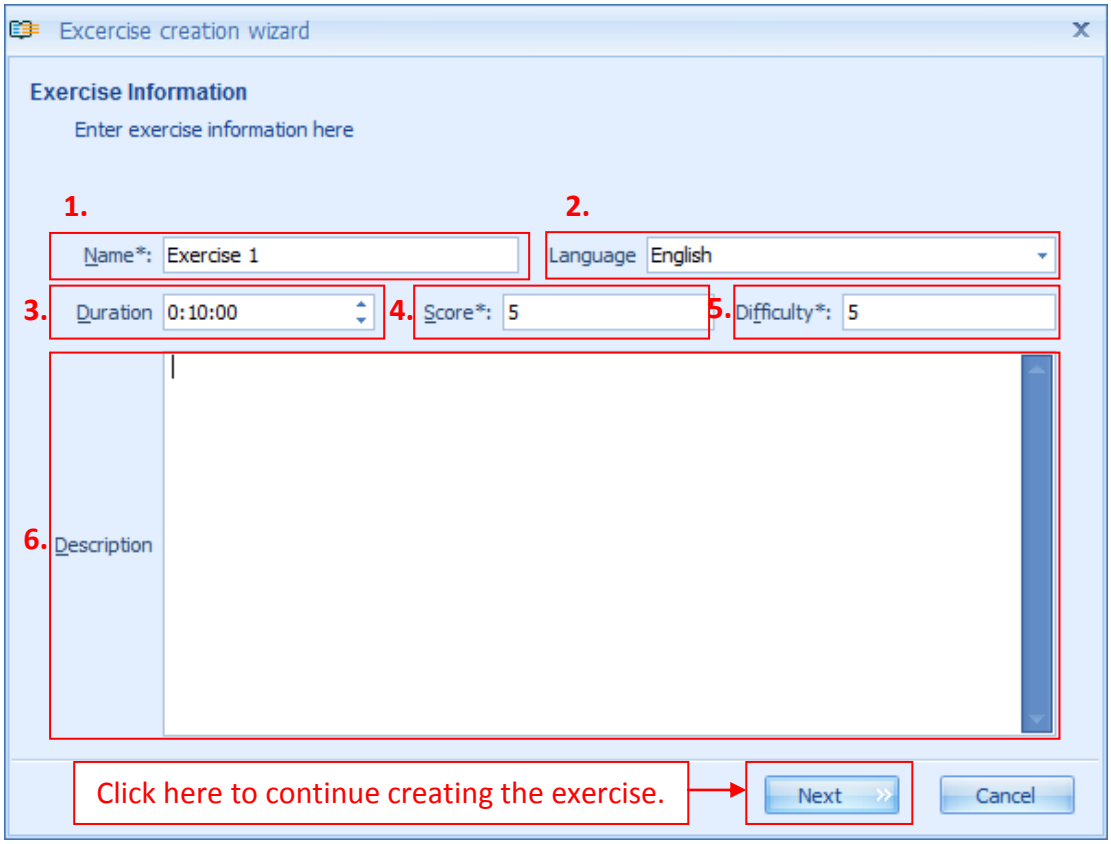
Theme 8: How to start creating a new exercise?

To start creating a new exercise the user must open the section"Subjects and Exercises" (See Theme 2). Sequentially they must find or create a subject (See Theme 7) in which the new exercise will be created. In order to create a new exercise the user must open the subject, click the cursor in the empty space on the right and select "Create exercise" from the offered menu. The alternative is to select a subject or theme in which the user wishes to create the new exercise and click on the icon for creating the new exercise.



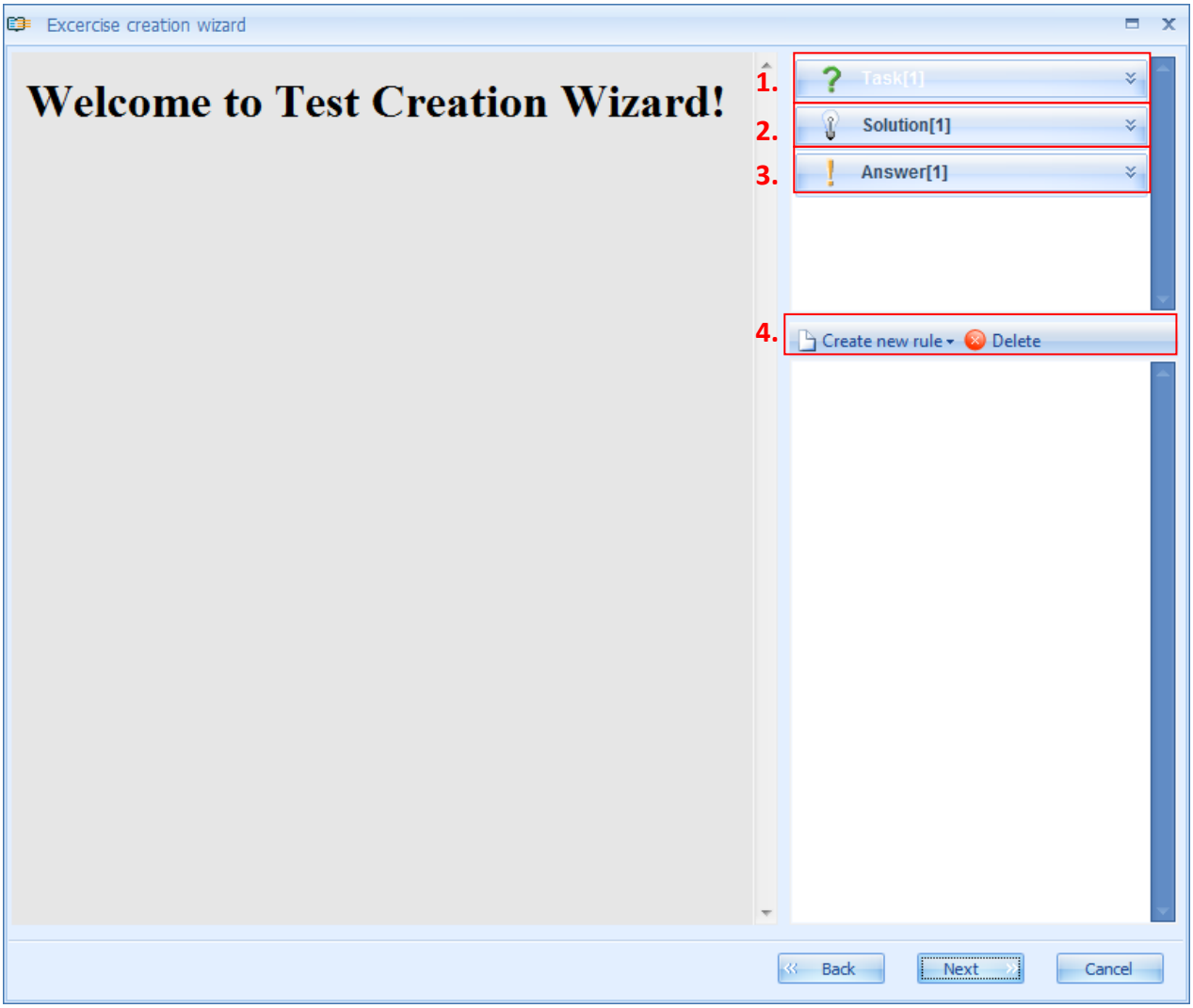
When clicking on “Create exercise” an Exercise Creation Wizard will appear (see Picture). To start creating an exercise, click on “Next”. If you wish to quit working with the Exercise Creation Wizard you can click on “Cancel”.

After clicking on “Next” a window for inserting information about the exercise will appear:



It is obligatory for the user to insert the exercise name [1], choose the exercise language [2], define the duration of the exercise (0:00:00 is respectively hours: minutes: seconds) [3], define the total score (from 1 to 10) [4] and define the level of difficulty (from 1 to 10) [5]. The user can also insert the exercise description in which it is possible to include references to methodological materials or other information. If one of the obligatory sections will not be filled out, the system won't allow the user to go to the next step of the exercise creation process. When all the obligatory information is inserted, click on "Next" to go to the next step.

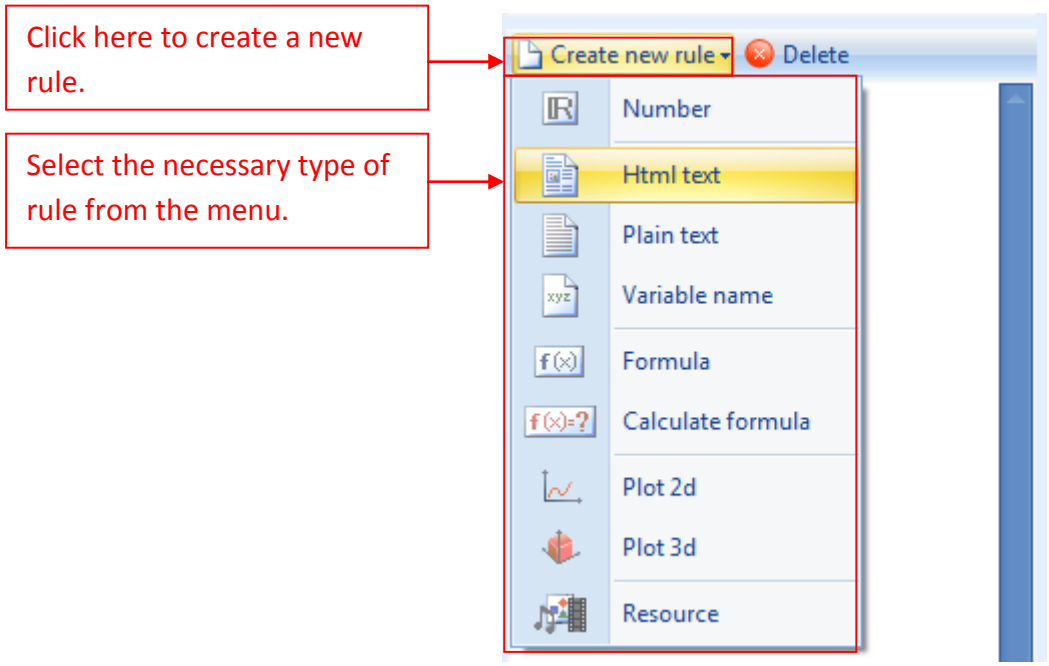
The next step is to insert the exercise content. This is done in the exercise creation wizard. The exercise content includes "Task" (see Theme) [1], "Solution" (See Theme) [2], and "Answer" (See Theme) as well as the tools for creating and deletion of new rules (variables) (See Theme 9) [4].



Theme 9: How to create a new rule?

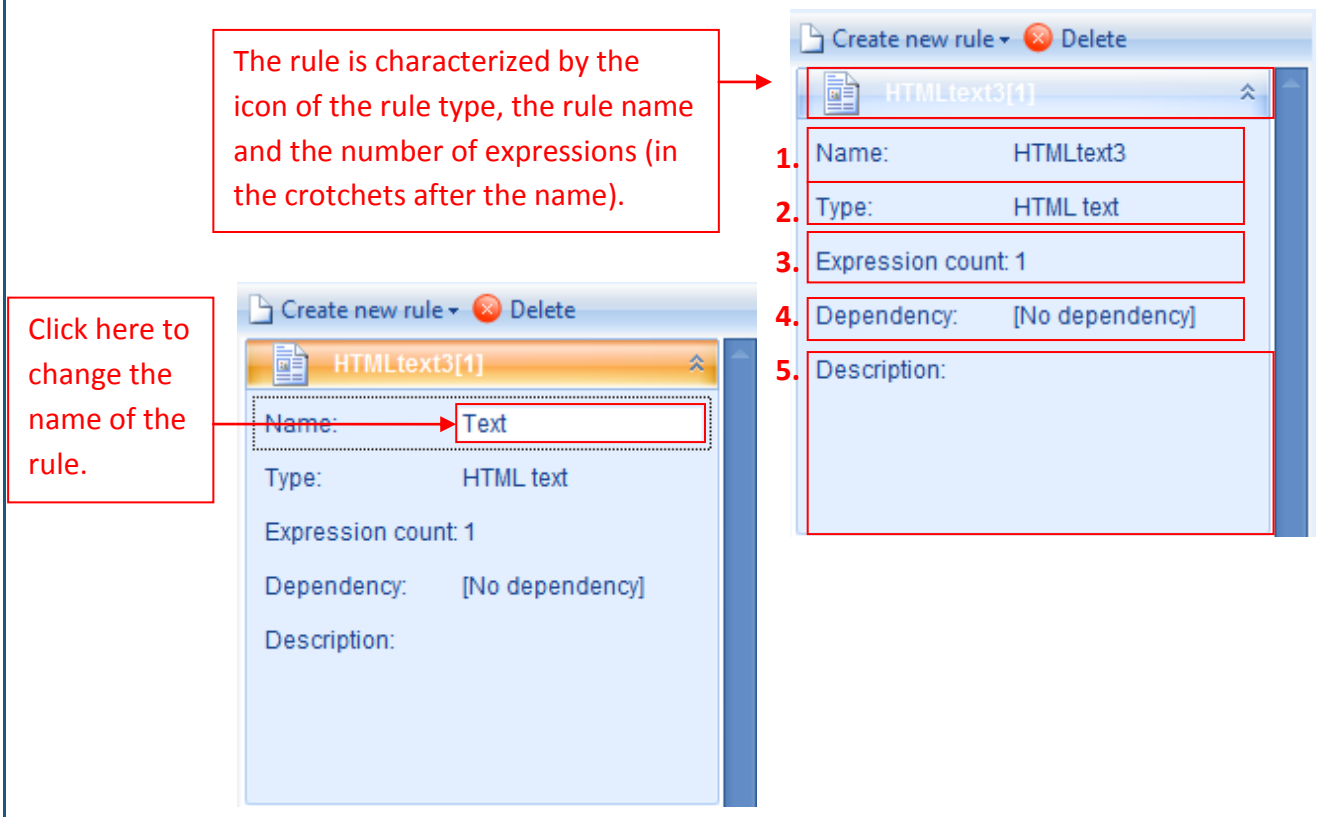
Rules are variables in the GenExis system and they are main components for ensuring the generation principle. The essence of the rules is to create variables (a number, text, formula, diagram, picture, etc.) which would change depending on the parameters inserted by the user but on random basis, or is modified according to other rules included in the content (for example, a formula, the content of which includes 2 number rules which will vary depending on how the rules of these numbers will change, but the number rules will change according to the parameters inserted by the user for these rules). Each type of rule will be discussed in the sub themes of this theme.

To create a new rule the user must click on "Create new rule" (See picture). When the rule menu opens, select and click on the type of rule you need to create.

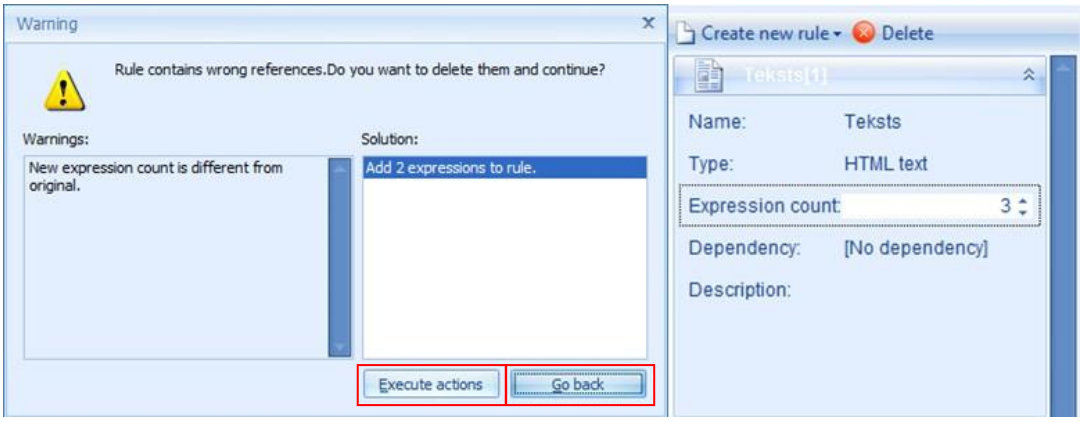


After clicking on the selected type of rule the system will create a new rule and add it to the list of rules under an automatically generated name.

Information about each rule consists of the following elements: its name [1], type [2], expressions count [3], dependency [4] and description [5]. The color of the rule which the user is currently working on in the content editing mode changes from dark blue to white. If the user is editing information about the rule, its color changes to orange. The user can change the name of any rule by clicking the cursor in the box next to the section “Name” and write in the new name of the rule.

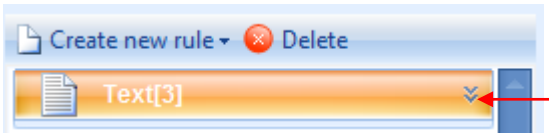


The user can change the expression count (the same way as the name), select dependency (see Theme 13) or add a description (optional). If the user changes the expression count in an information editing mode, a warning about creating incorrect references will appear (see picture). If you wish to save the newly created expression count, click on “Execute actions” and the system will automatically supplement the content of the chosen rule with extra expressions. To save the previous number of expressions, click on “Go back”.



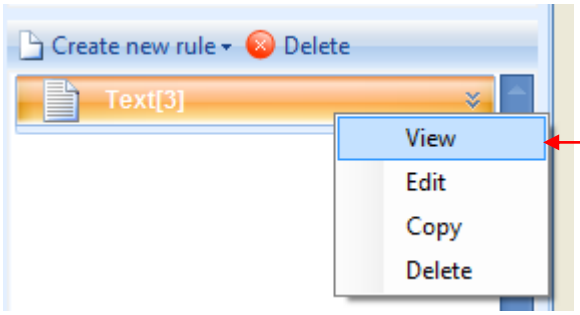
Rule information can be expanded when necessary (there can only be expanded information on one rule at a time). This can be done in two ways:

Method 1



Click here to extend information about the

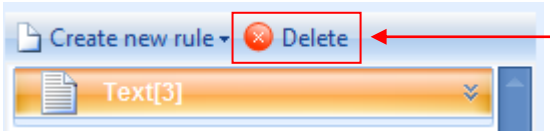
Method 2: click on the rule name with the right mouse button.



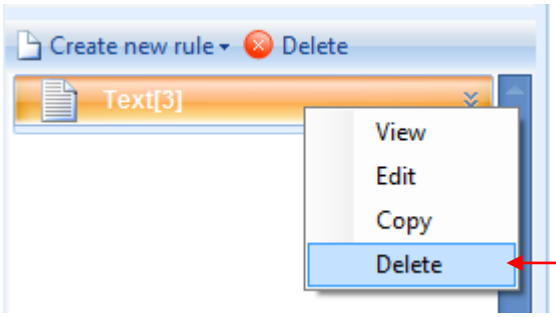
Select ”View” to extend information about the rule!

To close this information, use the method demonstrated in Method 1.

The rule can be deleted by clicking on it (it turns orange) and either clicking on “Delete” which is next to “Create new rule” or clicking the right mouse button and selecting “Delete” from the menu (See picture).



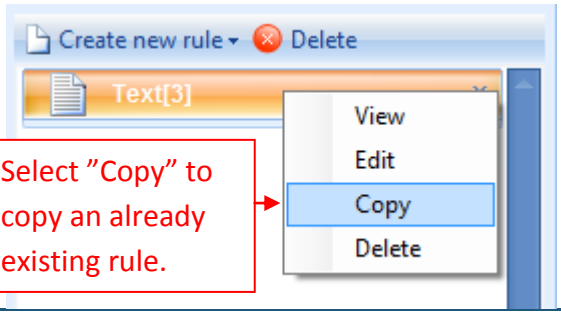
Click here to delete the rule.



To delete the rule select ”Delete”.

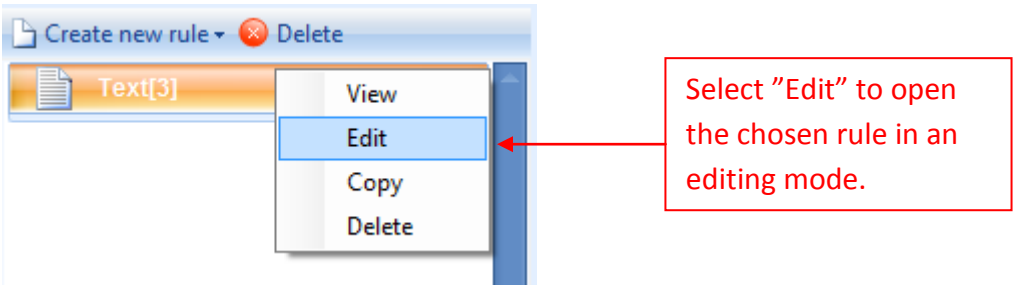
The system will once more ask if the user really wishes to delete the selected rule. Click “Yes” to confirm the action.

The user can copy an already existing rule thus forming an identical rule with another name (automatically generated by the system). The copied rule will be exactly the same both in content and the parameters as the originating rule. To copy a rule click the right mouse button on the selected rule and from the offered menu select “Copy” (See picture).



Select ”Copy” to copy an already existing rule.

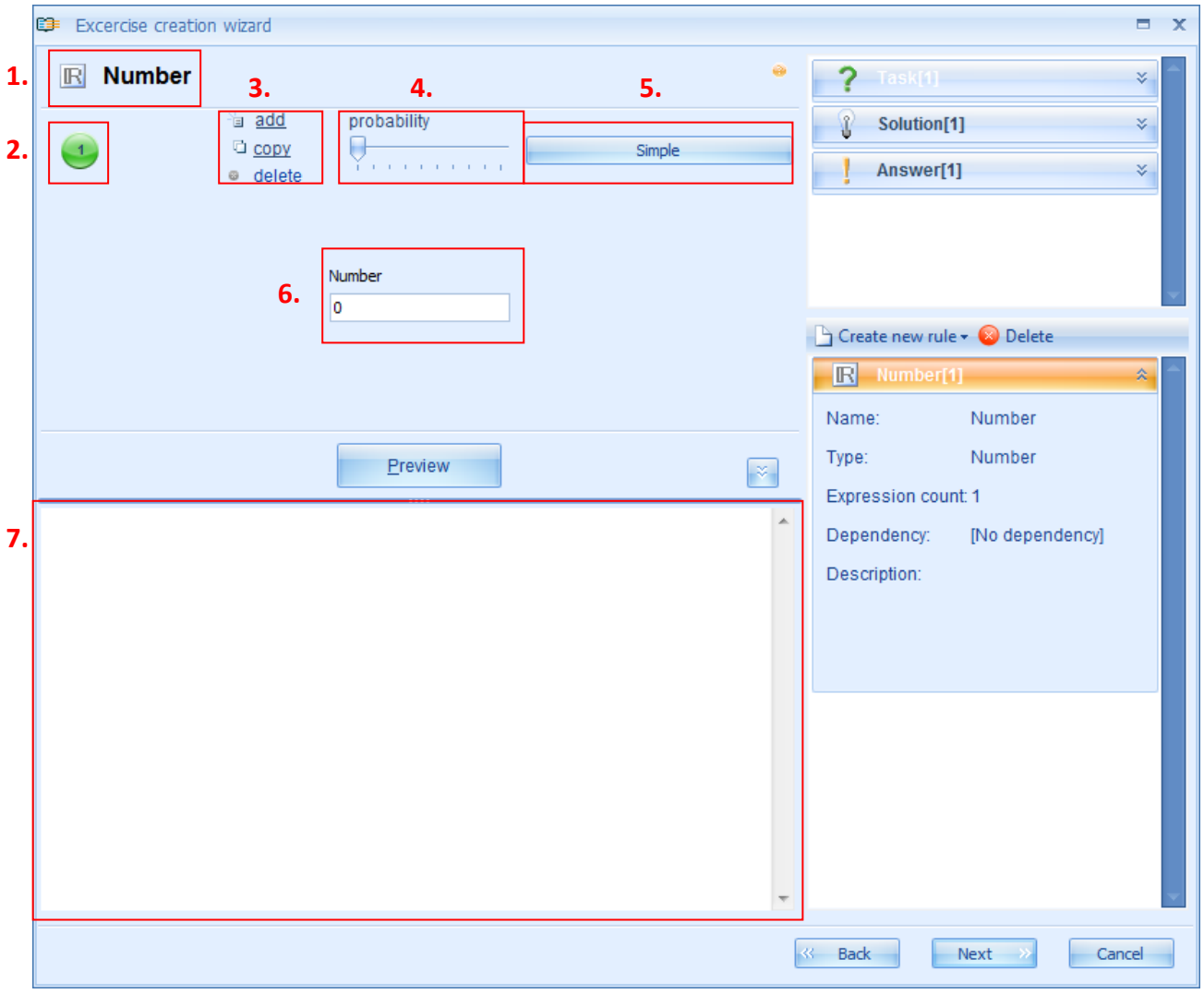
To open a certain rule in a content editing mode, double click with the left mouse button on the selected rule or click the right mouse button once on the rule name and from the offered menu select “Edit” (See picture).



9.1. Number

The number rule is used to define numbers in an exercise.

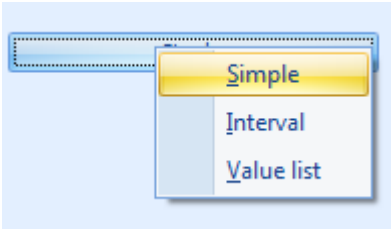
Following the previously named steps, the user creates a new number rule and opens it in the editing mode. The editing mode shows: the icon and the name of the rule [1], rule expression count [2], tools for adding new expressions, copying and deleting expressions [3], a tool for determining the probability of the selected expression [4], the type of the rule [5], the rule content insertion box [6], the rule preview box [7]



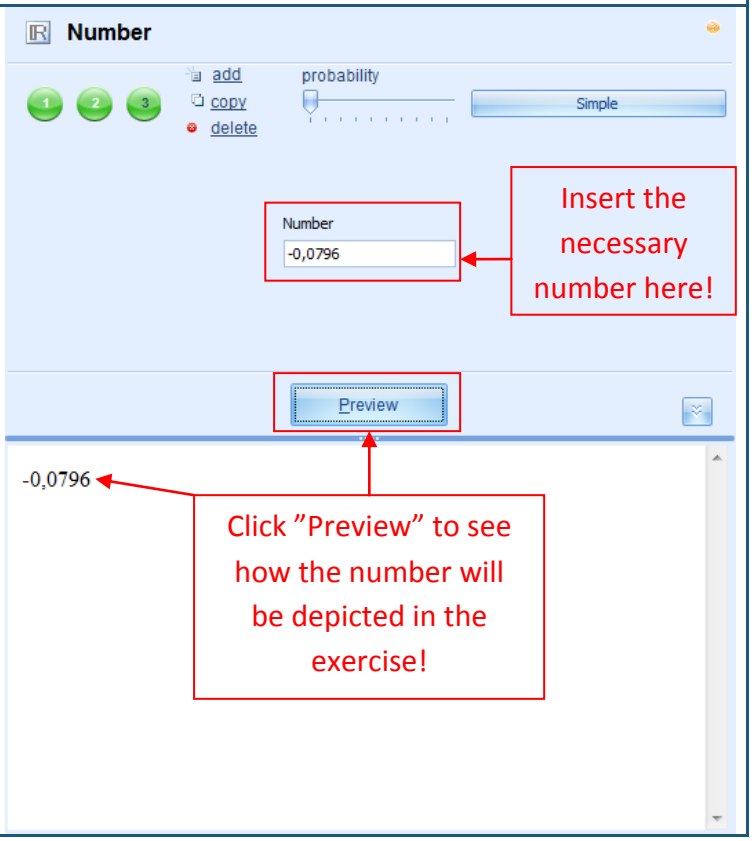
Adding a new expression: One number rule can include more than one expression. To add a new expression, click on "Add" [3] – the system will automatically add a new and undefined expression to the selected rule.

To edit the content of an expression or to delete it, the user must activate the selected expression. When selected, the color of the activated expression serial number changes from white to black.

Copying an expression: After the expression has been activated, the user can copy it by clicking on "Copy". The system will automatically create a new expression and add it at the end of the list of expressions. This expression will be identical both in type and content to the copied expression.
Deleting an expression: When an expression has been activated, the user can delete it by clicking on "Delete" [3].
Inserting / editing expression content: To insert the expression content the user must first select the type of the rule: Simple, Interval or Value list. With the left mouse button click on "Simple" and select the necessary type from the menu offered.

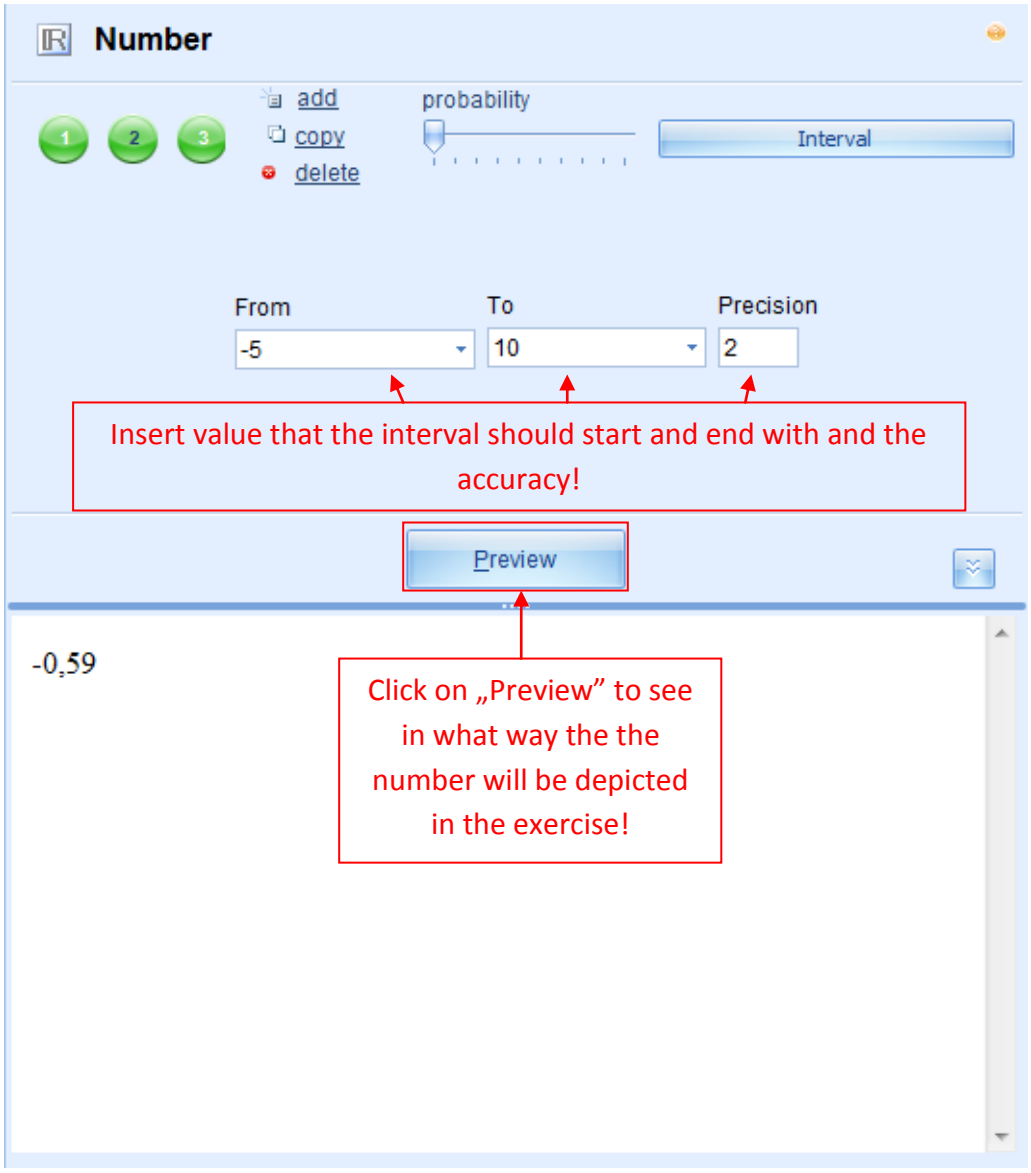


Simple number means that the user can insert only one number in one expression (an integer or a decimal number; a positive or a negative number). To do this the user must activate the expression in which they wish to make changes in (to insert content or to edit it), click the cursor in the box provided for content input and insert the necessary number using the computer keyboard. After inserting the number, click on "Preview" to see how the number will be depicted in the exercise.

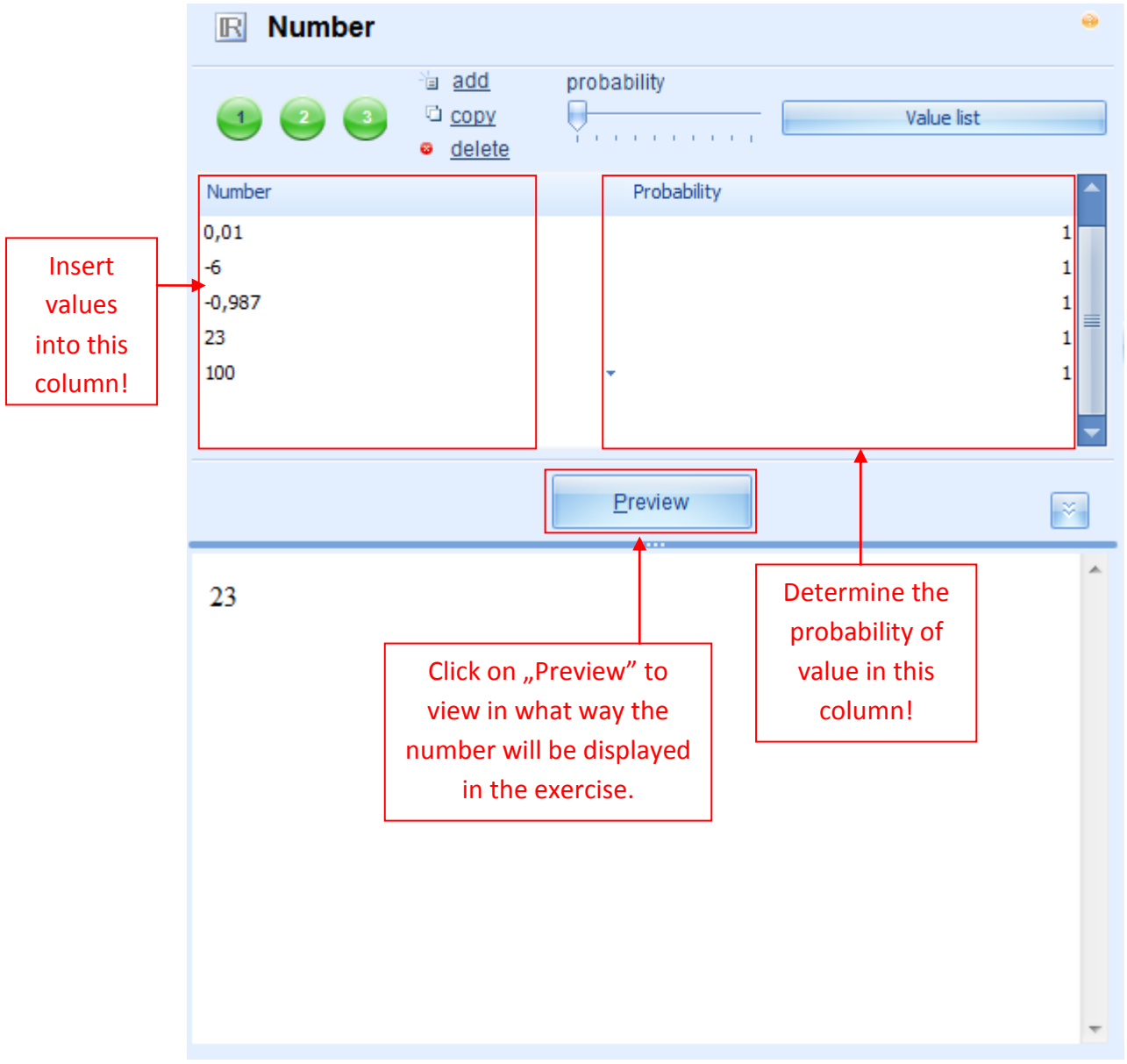


Interval means that the user can define the group of numbers as an interval with a fixed (determined) accuracy from which the system will choose a particular number based on the randomness principle.

In order to create a new expression, which contains an interval, change the expression type to Interval; click the cursor in the field „From" and type in the number or choose a number rule from the menu, which would contain values that the interval should start from. Then click cursor in the field „To" and type in the number or select a number rule from the menu, which contains values that the interval should end with. And determine the accuracy that the system should choose the number values from the corresponding interval – accuracy determines with what number after comma should the corresponding number be selected (the accuracy for the whole numbers will be 0); numbers with one digit after comma the accuracy will be 1 etc.). Click on „Preview" in order to view in what way the number will be displayed in the exercise. By repeatedly clicking on „Preview" the user can follow how the system chooses other numbers from the defined interval.

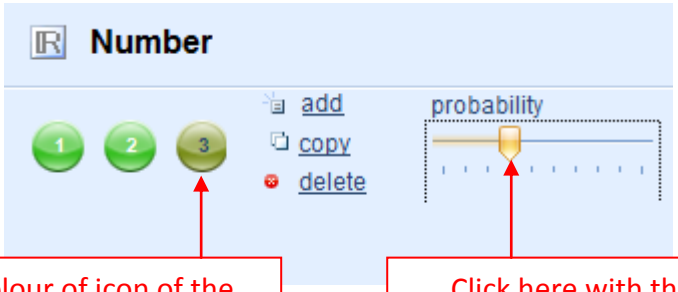


Value list means that the user can enter different numbers (whole numbers and decimal numbers; positive and negative numbers) in the form of a list defining the probability for each number.
In order to create an expression containing a value list, change the expression type to Value list. There will appear a field with two columns „Number" and „Probability". Click the cursor in the beginning of „Number" column and type in the number or choose it from the number rule's menu, which contains values you want to include in this list. Each value included in the list will be automatically set with probability „1". If the user wishes any value to appear more frequently than others it is possible to increase the probability. Click on „Preview" to view in what way the number will be displayed in the exercise. By repeatedly clicking on „Preview" the user can see that each time the system chooses other numbers from the defined value list. By clicking many times they should notice that those values with greater probability set will appear more frequently in the preview mode.



Determining the probability of expressions: if one rule has several expressions then it is possible to determine the probability that the corresponding expression will appear in the exercise with.

The expression with greater probability defined will appear more frequently than the others in the exercise during the generation process.



The colour of icon of the evaluated probability changes from green to red when the probability from the minimal to the maximal!

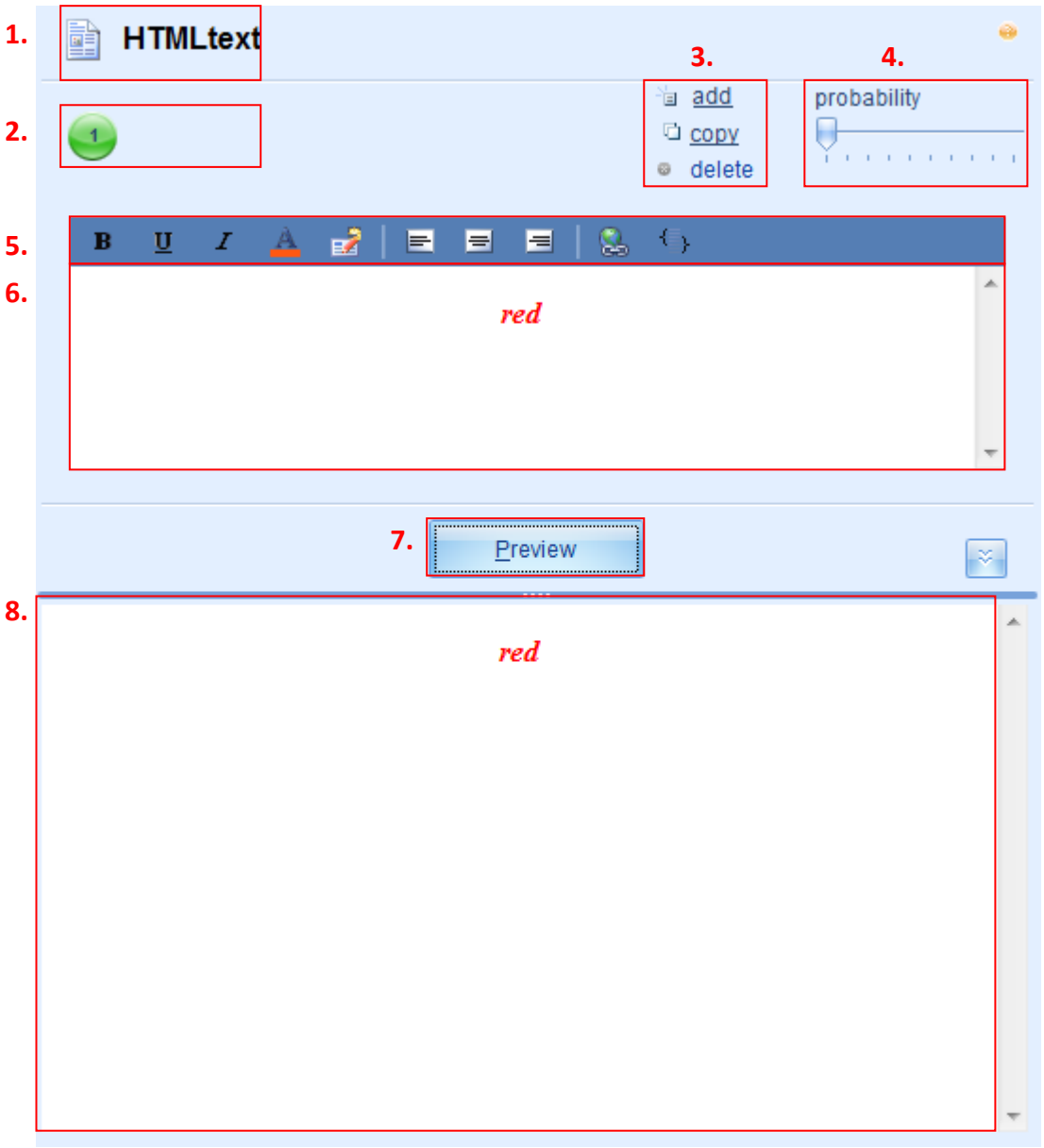
Click here with the left mouse button and move the marker to the right to increase the probability of the particular expression, to the left – to decrease it.

Note: within the limits of a single rule, which contains several expressions, each expression can be defined in a different way (for example, one expression can be a simple number; other – an interval but the third – list of values).

Recommendations: By choosing the number rule type (Simple, Interval or Value list), evaluate, which would be the most appropriate to disclose the content of exercise. It is necessary to use simple numbers when creating the dependencies between the specific values (see Theme) within one exercise. It is convenient to use the list of values when you need to insert numbers to which refer any rules and they cannot be displayed like an interval (for example, the prime numbers).

9.2. HTML text

Html text rule is used to insert such variable text into the exercise, which can be formatted already in the editing mode of the rule.
Following the previously named steps create a new, simple text rule and open it in the editing mode. The editing mode shows: the icon and the name of the rule [1], the type of the rule [2], tools for adding new expressions, copying and deleting new expressions [3], tool for determining the probability of the selected expression [4], toolbar for editing of the rule content [5], field for entering of the rule content [6], rule preview button [7] and field [8].



Html text rule does not have various ways how to insert text. To insert the text type (title, sentence, paragraph etc.) new expression(s) must be added. Adding of a new expression, copying and deleting of expression as well as determination of probability occurs in the same way as for the number rule (see Theme 9.1).

The toolbar for rule content editing is used to format Html text:

Functions 1-3 ensure the display of content elements in bold [1], underlined [2] or Italic [3]. Function 4 allows changing the color of the particular element. The positioning of elements in the content can be edited by using centering [7], alignment to the left [6] or alignment to the right [8]. The editor also allows insertion of a hyperlink [9].

The toolbar can be adjusted to the needs of each user by using the icon 5. Click the right mouse button on it and you will be offered the function „Customize...” which when selected will open a new window in which the user will be able to edit their settings.

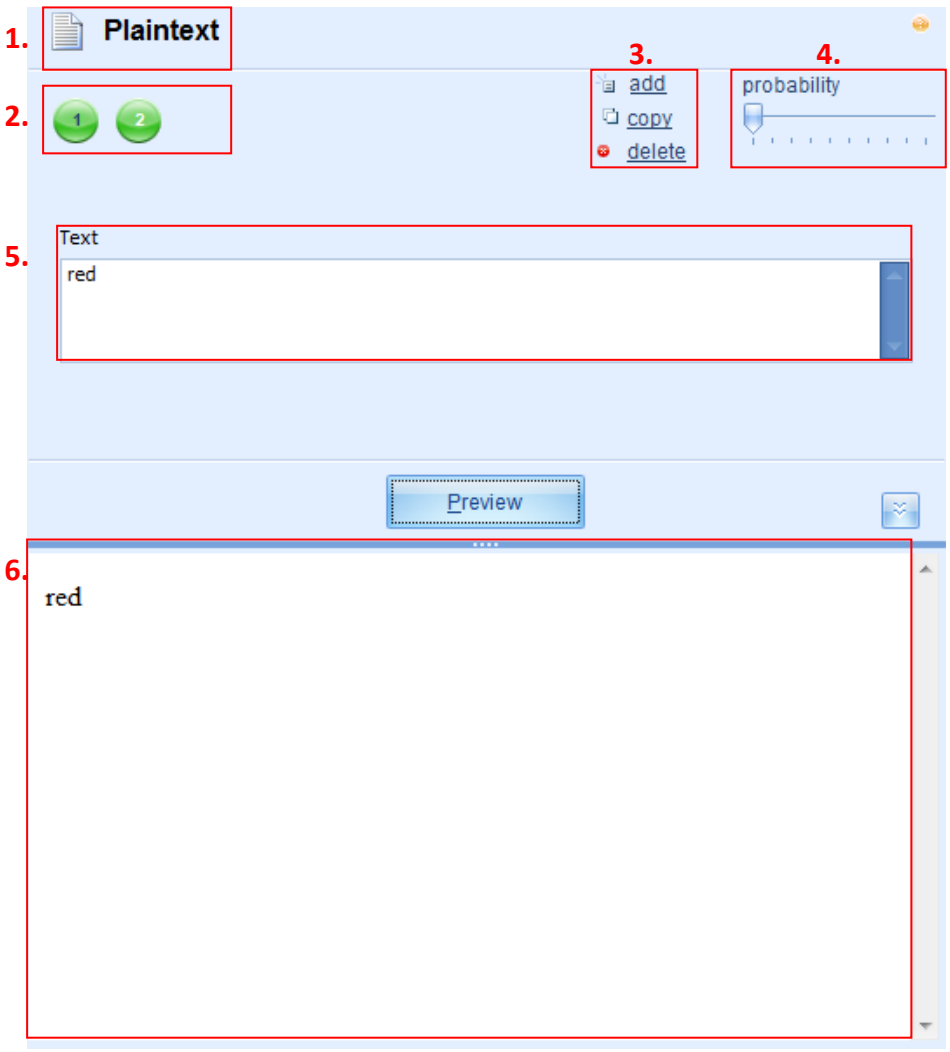
For more complex content editing use the HTML code [10] but using it requires specific knowledge which is not discussed in these guidelines.

Insertion of Html text occurs in the following way: click the cursor into the field - for content entering and type in (or copy-paste from a text document) the particular text. Format the inserted text by using the available toolbar according to your needs. Click on “Preview” to view what the text will look like in the exercise content.

Note: it is efficient to use the Html text in all cases when you need to create an exercise in which not only the text but also style of the text needs to be changed depending upon any other parameter in the exercise. If you need to simply insert the variable text then it is easier to use the Plain text rule (see Theme 9.3).

9.3. Plain text

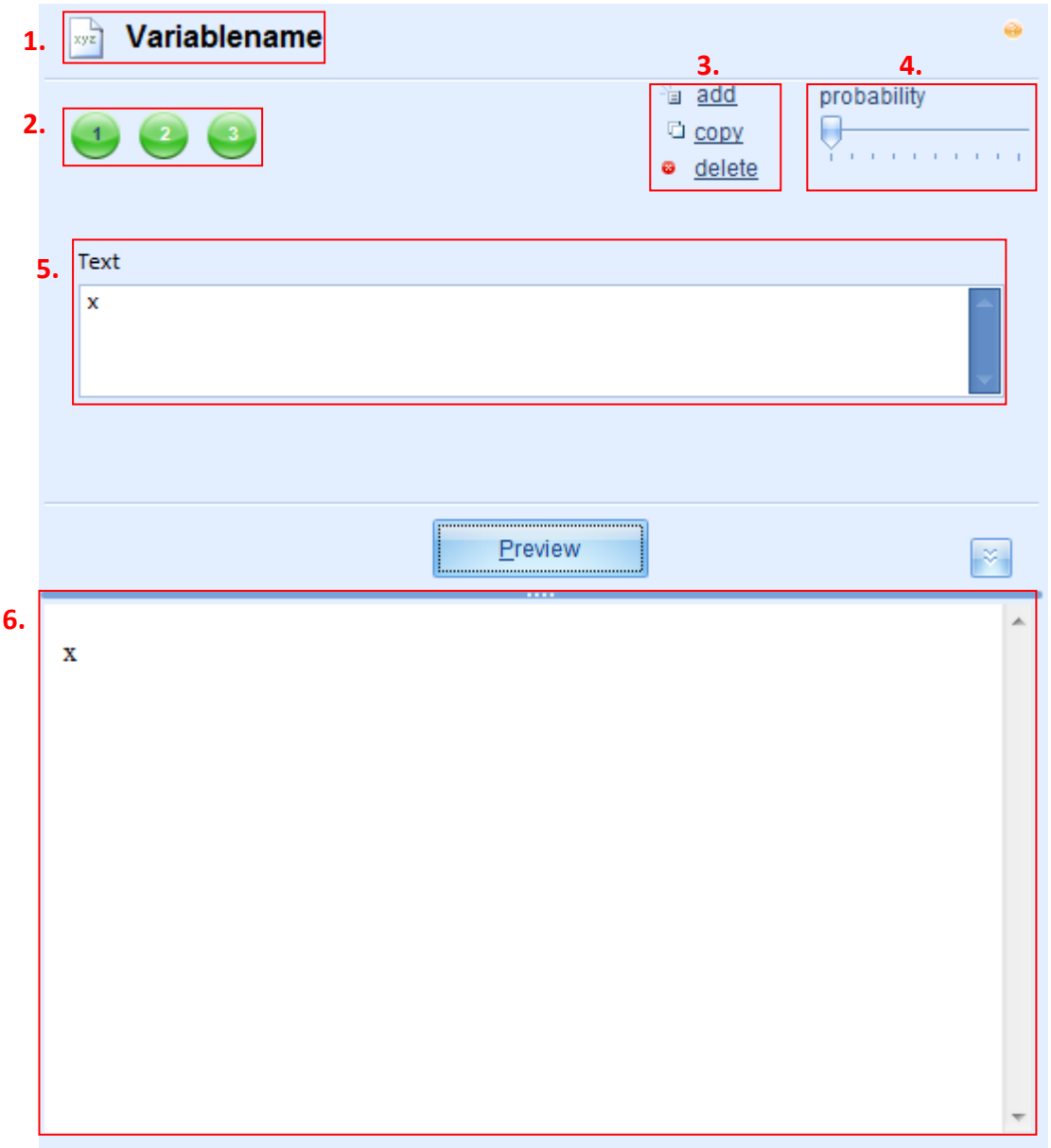
The plain text rule is used to insert the variable text into exercise.
Following the previously described action steps let's create a new plain text rule and open it in the editing mode. The editing mode will show: the icon and the name of the rule [1], count of rule expressions [2], tools for adding new expressions, copying and deleting expressions [3], tool for determining the probability of the selected expression [4], field for entering rule content [5], rule preview field [6].



The plain text rule does not have several text entering possibilities. For entering text variations (word, sentence, paragraph etc.) you need to add new expression(s). Adding of a new expression, copying and deleting of expression as well as determination of probability occurs in the same way as for the number rule.
Insertion of plain text takes place in the following way: click the cursor in the content entering field and type in (or copy-paste from a text document) the corresponding text. Click on "Preview" to view what the text will look like in the exercise content.

9.4. Variable name

The variable name rule is used to create the variable values of letters/text for insertion into formulas. This rule is typically used to define the unknown value (e.g. c, y, z etc.).
Following the previously described actions create a new variable name rule and open it in the editing mode. Editing mode displays: rule type icon and title[1], count of rule expressions [2], tools for adding new expressions, copying and deleting expressions [3], tool for determining the probability of the selected expression[4], field for entering rule content [5], rule preview field [6].

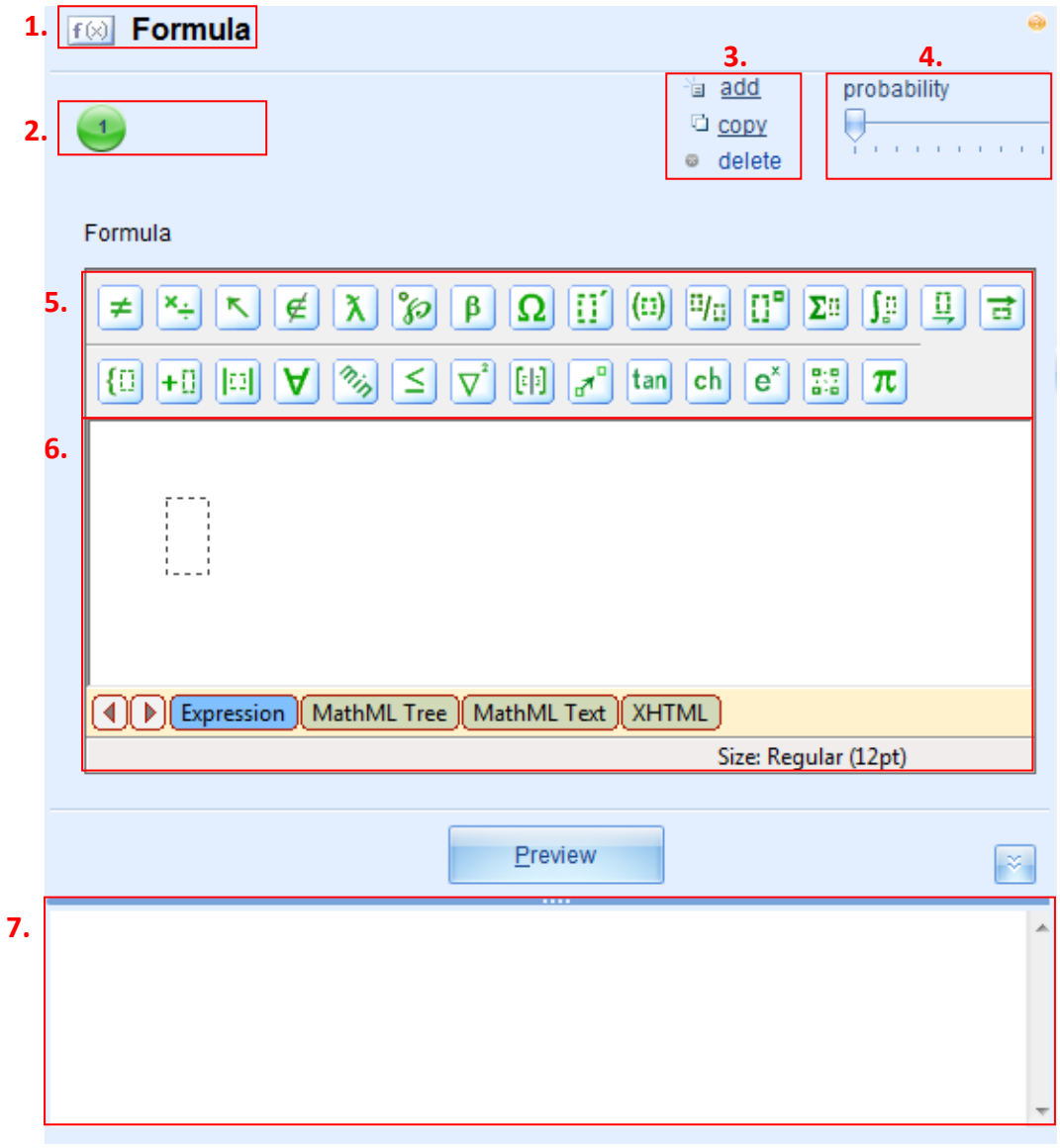


The variable name rule does not have various text entering possibilities. To insert new variants you need to add new expression(s). Adding of a new expression, copying or deleting of expression as well as determining of probability occurs in the same way as for the number rule (see Theme 9.1).

Inserting variable name's content takes place in the following way: click the cursor in the text insertion field and type in (or copy-paste from a text document) the corresponding text (this rule is not meant for insertion of longer texts – usually it is one letter or one word). Click on "Preview" to view what the text will look like in the exercise content or, for example, formula content.
Note: it is not possible to insert any other text type except for Variable name into the formula rule wherewith this rule can be used to define the unknown mathematical expressions as well as to insert indices into the formulas, which contain lengthening marks and diacritic signs.

9.5. Formula

The formula rule is used to create different (simple or complex) formulas, which are not mathematically calculated (representative formulas). It is convenient to use the rule to create theoretical formulas for supplementation of the theoretical substantiation of exercise solution.
Following previously described actions let's create a new formula rule and open it in the editing mode. The editing mode shows: rule type icon and title[1], count of rule expressions [2], tools for adding new expressions, copying and deleting expressions [3], tool for determining the probability of the selected expression [4], formulator toolbar [5], formula insertion field [6], rule preview field [7].

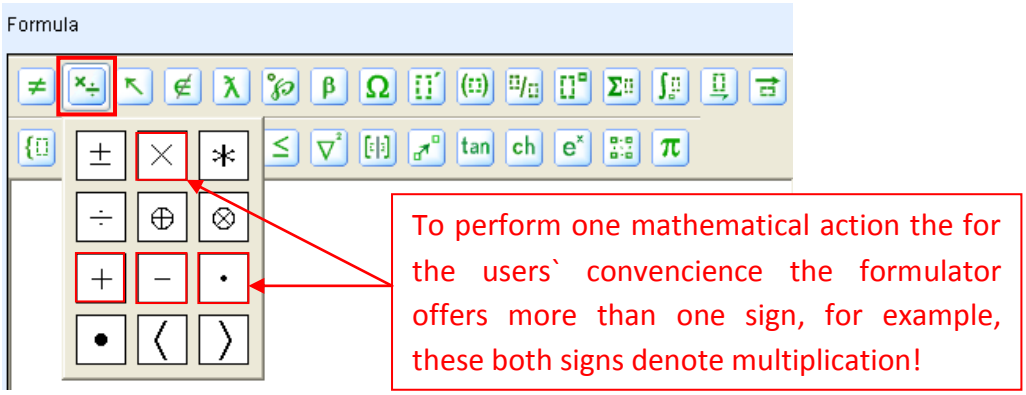


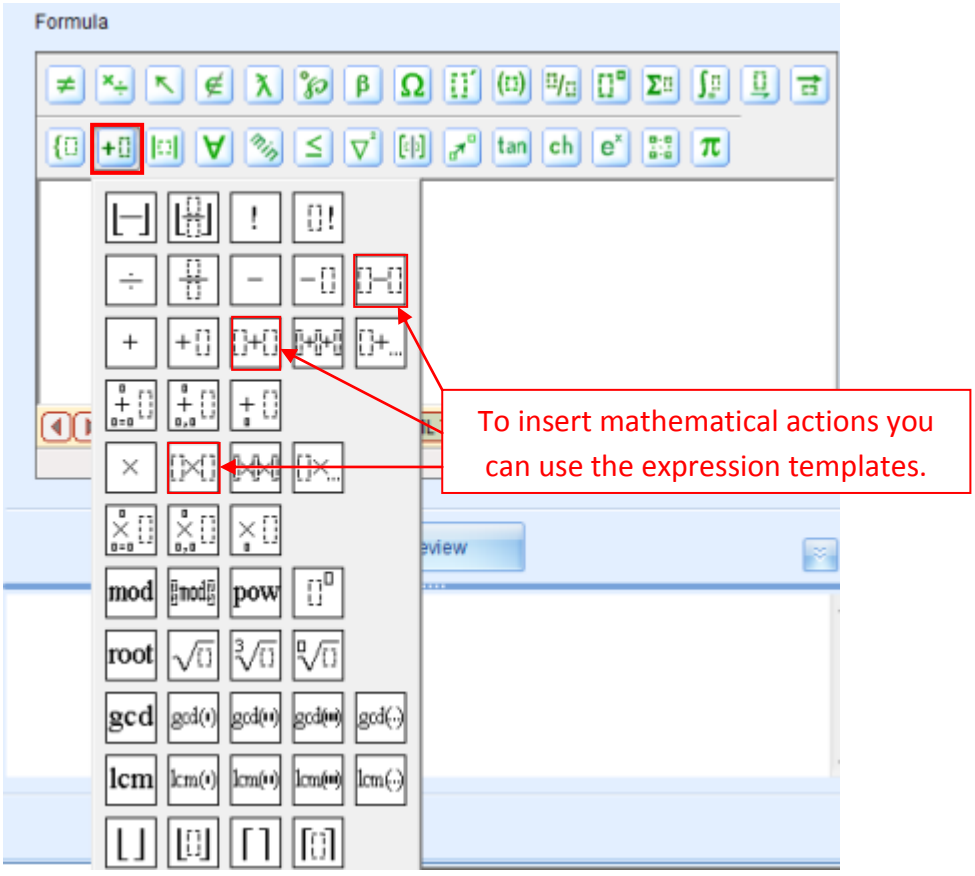
The same as for all other text rules the formula rule does not have various insertion ways wherewith to insert formula variants you have to add new expression(s). Adding, copying and deleting of a new expression as well as determining the probability occurs in the same way as for all the previously described rules.

Inserting of formula into the formula field [6] occurs by using the formulator toolbar [5] and "drag and drop" principle. The formulator toolbar contains the formula icons divided into two rows, which when selected open a new menu with different mathematical functions. Since basically this is a representative formula there are no strict rules to observe during the insertion process. Namely you can find several mathematical functions in the menu groups under different icons in the formulator toolbar for seemingly one and the same mathematical action (wherewith they have different implications).

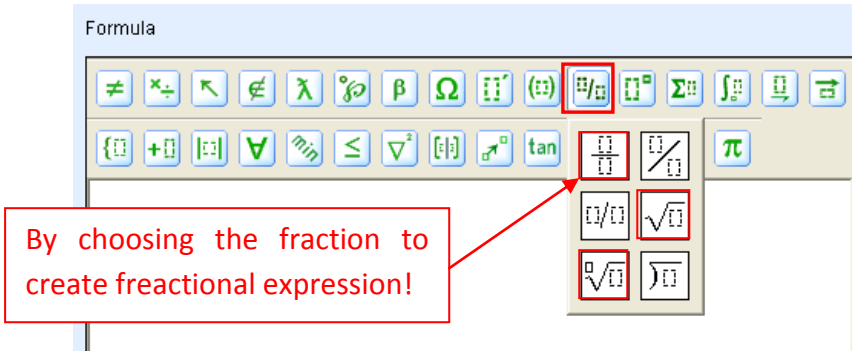
Let`s see several examples:

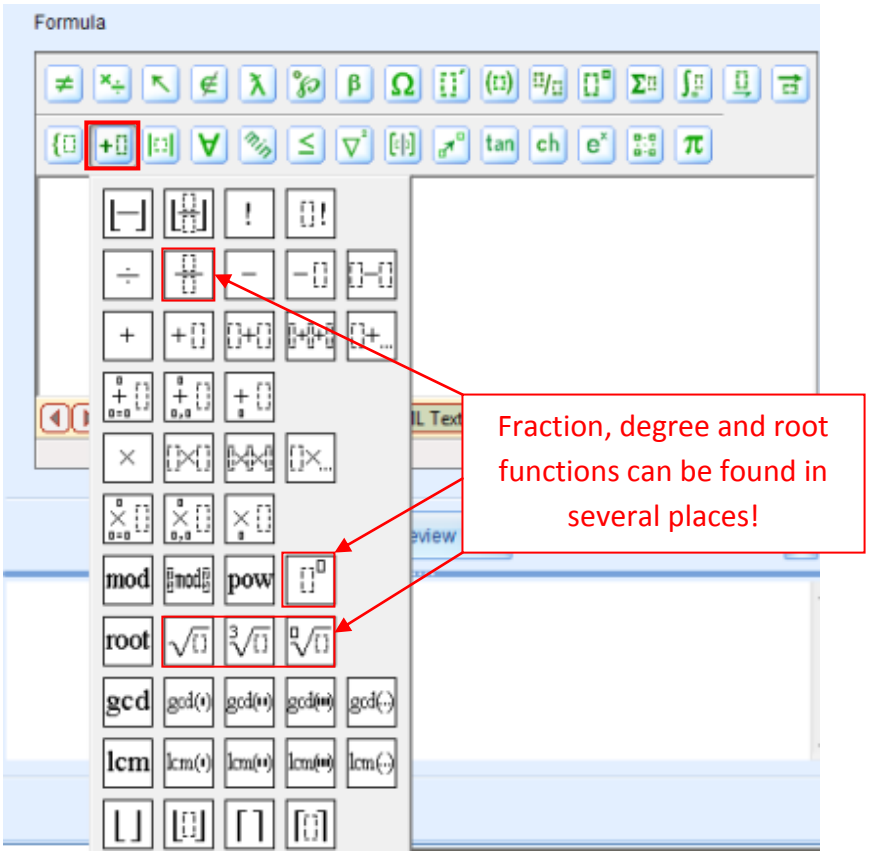
1. It is possible to insert such mathematical signs as „=", „+" etc. by using the keyboard. But it does not mean that they couldn't be found in the formulator's toolbar. Let's look at the possibilities:



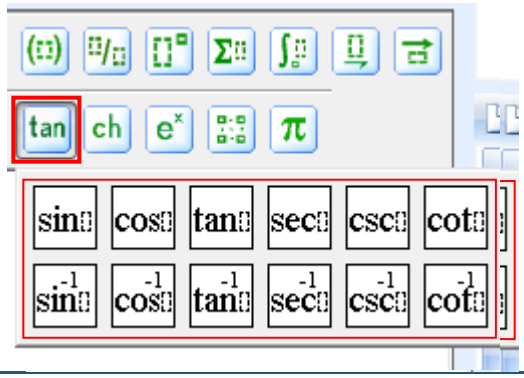


2. To insert fractions, roots and degrees the formulator offers multiple function menu:

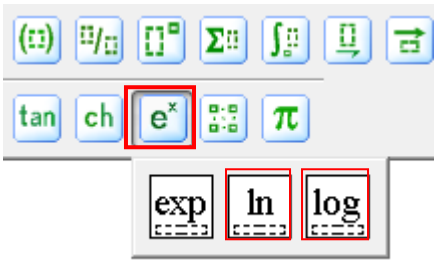




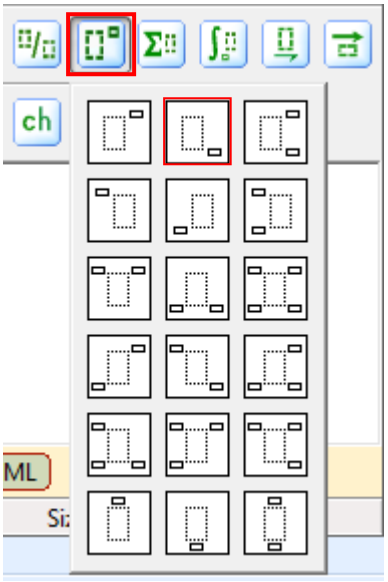
3. Trigonometric formulas:



4. Logarithmic functions:



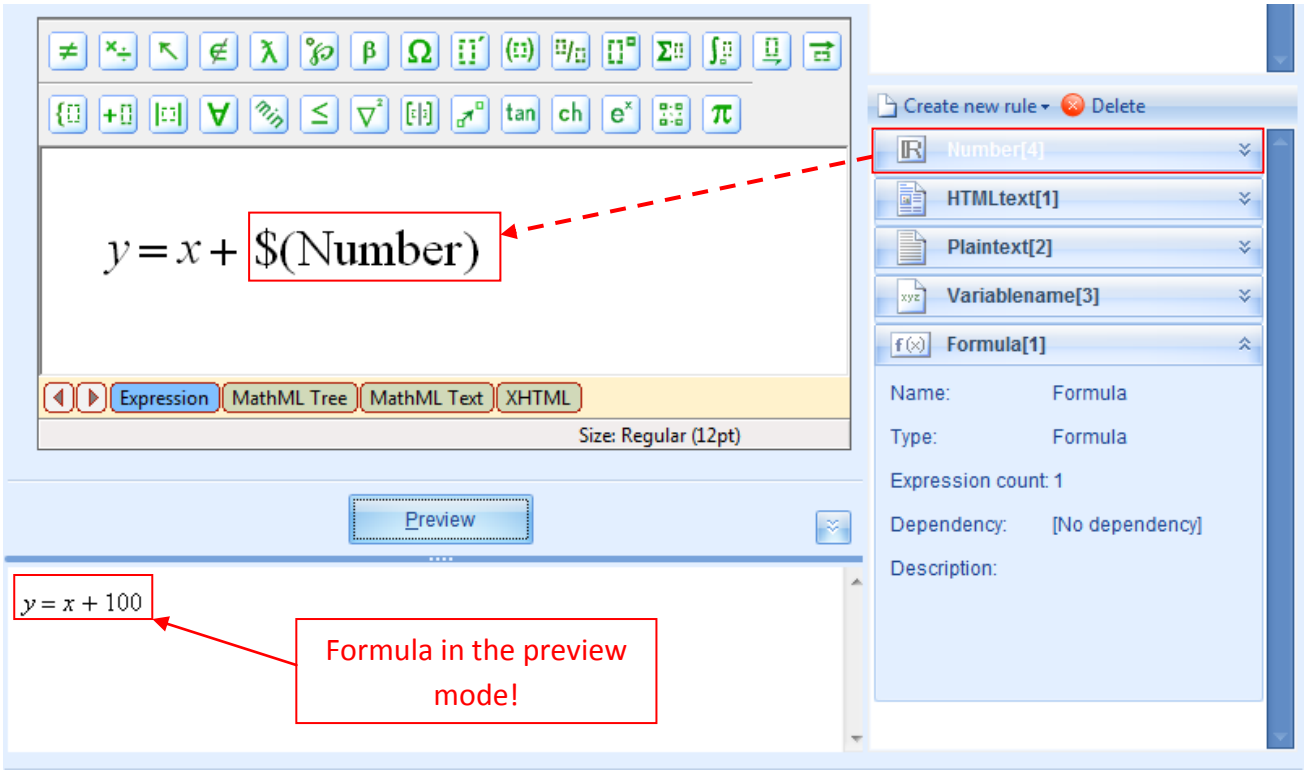
5. It is essential to use different indices in the chemical formulas:



The chemical formula is also one of the answer types that`s why it is essential that the answer has been inserted correctly. Namely, the indices in the chemical formula must be added exactly to the part of the chemical compound that they refer to. For example, the index 2 in the substance K_2SiO_3 refers to Potassium and the index 3 to Oxygen therefore it would be incorrect to insert formula in the manner that the index would refer 3 to the SiO group. Wherewith it is advisable to initially enter the chemical formula without the chemical formula then choose the index function from the toolbar!

These are only some of the function examples that can be found in the GenExis formulator. When starting to work with the GenExis formulator for the first time each user must thoroughly explore the functionality offered by the formulator and find the most convenient way of using it according to the requirements of the particular exercise. In general, the upper generator's toolbar contains mainly representative functions, which are more related to Formula rule but the lower toolbar contains functional functions which are used to define the Calculate formula rule (see Theme 9.6) to help perform the mathematical actions and insert formulas in the answer correctly.

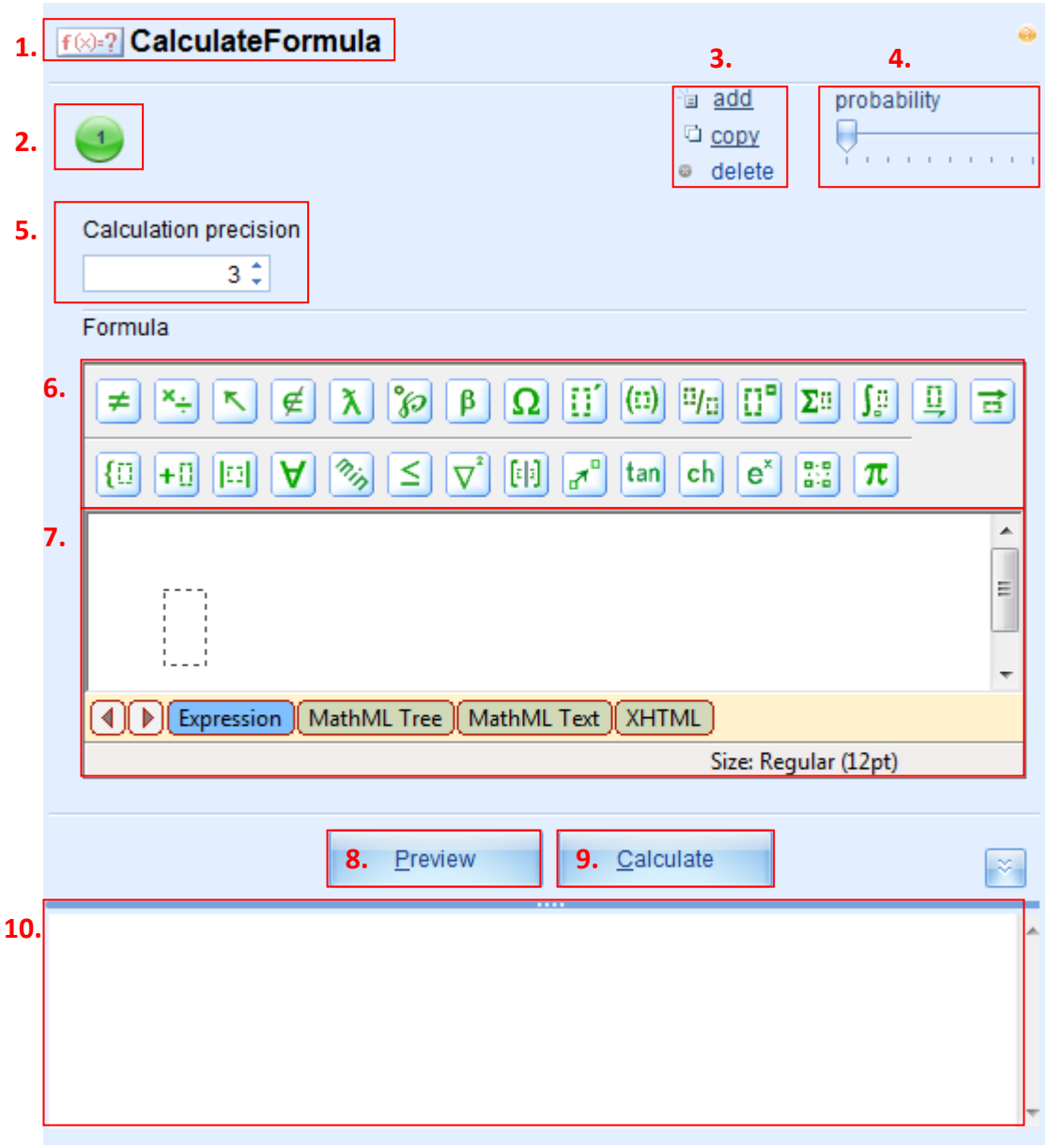
In order to enter any formula it's often not enough with being able to use the formulator toolbar. The most part of theoretical formulas are composed of different symbols thereby they might not contain any other values (in that case it can be simply inserted by using the wide range of mathematical functions and keyboard for entering letters and numbers). Still if there is a need to create step-by-step solution which displays representative formulas, which contain numbers defined in the exercise or obtained in the calculation process then frequently you have to use the **„drag and drop" principle** to insert any of created exercise rules into the formula.
In order to drag the rule into the formula, click the cursor right in the place where it is necessary "to drop" the particular rule. Sequentially click the left mouse button on the rule that you want to drag into the formula and by holding the mouse button pressed drag the particular rule inside. By letting go the mouse button the rule should "fall in" the right place (see example).



By using the "drag and drop" principle not only the number rules but also any other formula rule can be inserted into the formula (wherewith it is not necessary to repeat the insertion of the outgoing formula in case it is necessary to continue theoretical transformations within the exercise frame), rule of the variable name or calculation formula rule (the formula will display the calculation result).
When the formula has been created according to the user's needs they can click on "Preview" button to preview the obtained result.

9.6. Calculate formula

Calculation of formula is used to create different (simple or complex) formulas to calculate.
Following the previously mentioned steps, the user creates a new calculate formula rule and opens it in the editing mode. The editing mode shows: the icon and the name of the rule [1], rule expression count [2], tools for adding new expressions, copying and deleting expressions [3], a tool for determining the probability of the selected expression [4], tool for determining the accuracy of calculations [5], formulator toolbar [6], the rule content insertion field [7], preview button [8], calculation button [9], rule preview field [10].

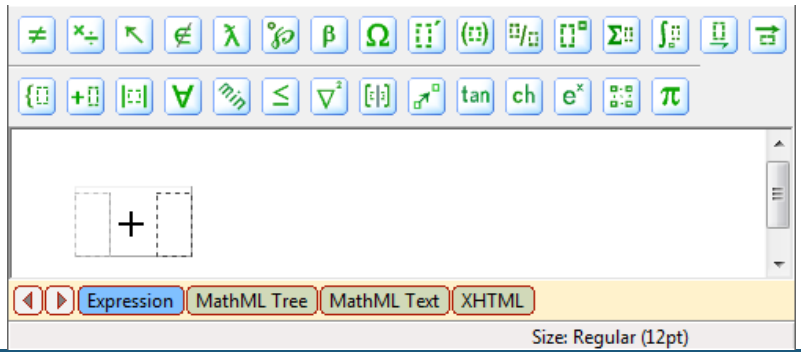


Likewise as for the formula rule, the calculate formula rule does not have different ways of insertion wherewith to insert formula variants you have to add new expression(s). To add a new expression, copying and deleting of expression as well as determining the probability occurs in the same way as for all the other previously described rules.

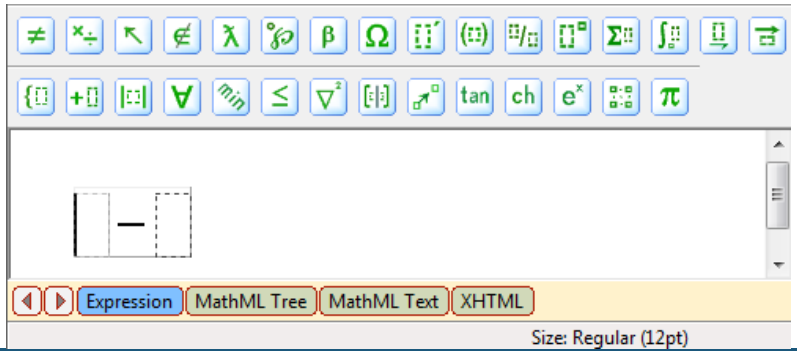
Determining the calculation precision is possible using the calculation precision tool [5]. This tool allows setting up the number of digits after comma that the result should be approximated to (if 0 is selected then the result will be a whole number). The calculation accuracy of newly created Calculate formula rule will always be 3, it can be changed by using keyboard to type in other number in the corresponding field or by using arrows on the right side of insertion field.

The calculation rule for inserting the formula must be performed carefully by using the correct mathematical functions from the available toolbar, thus not only ensuring the correct calculation result, but in cases when the answer to a problem must be inserted as a general formula the system when comparing the pupil's answer with the correct answer inserted by the teacher can precisely determine the correctness of the pupil's answers. To ensure this option it is recommended to use the so called hot keys. Following are the most frequently used hot keys in the calculation rule:

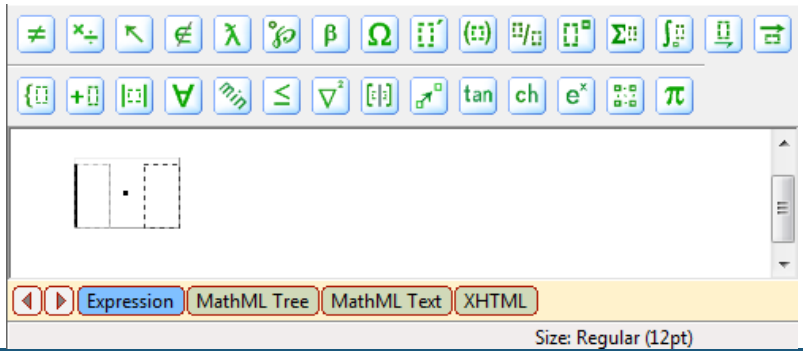
Addition: using the keyboard, insert **„+„** thus acquiring the addition function of two expressions:



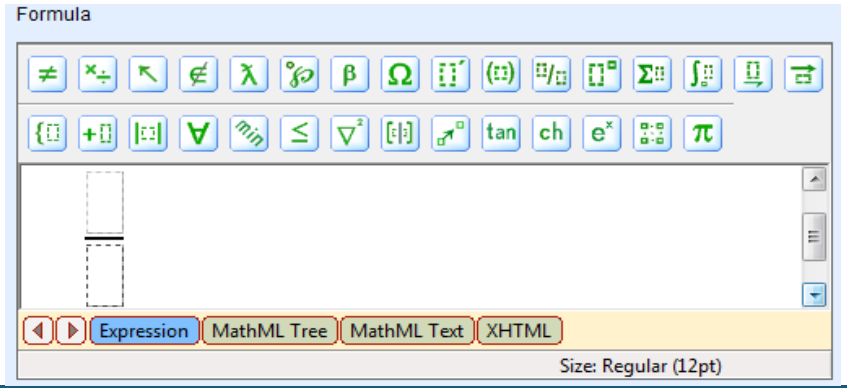
Subtraction: using the keyboard, insert **„-„** thus acquiring the subtraction function of two expressions:



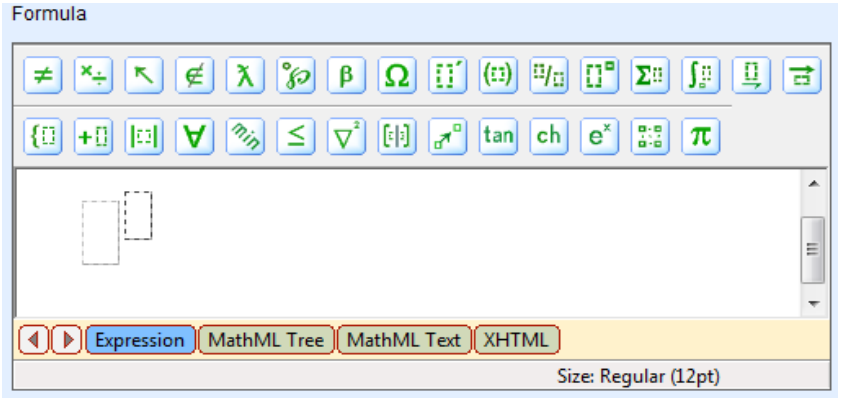
Multiplication: using the keyboard, insert **„*„** thus acquiring the multiplication function of two expressions:



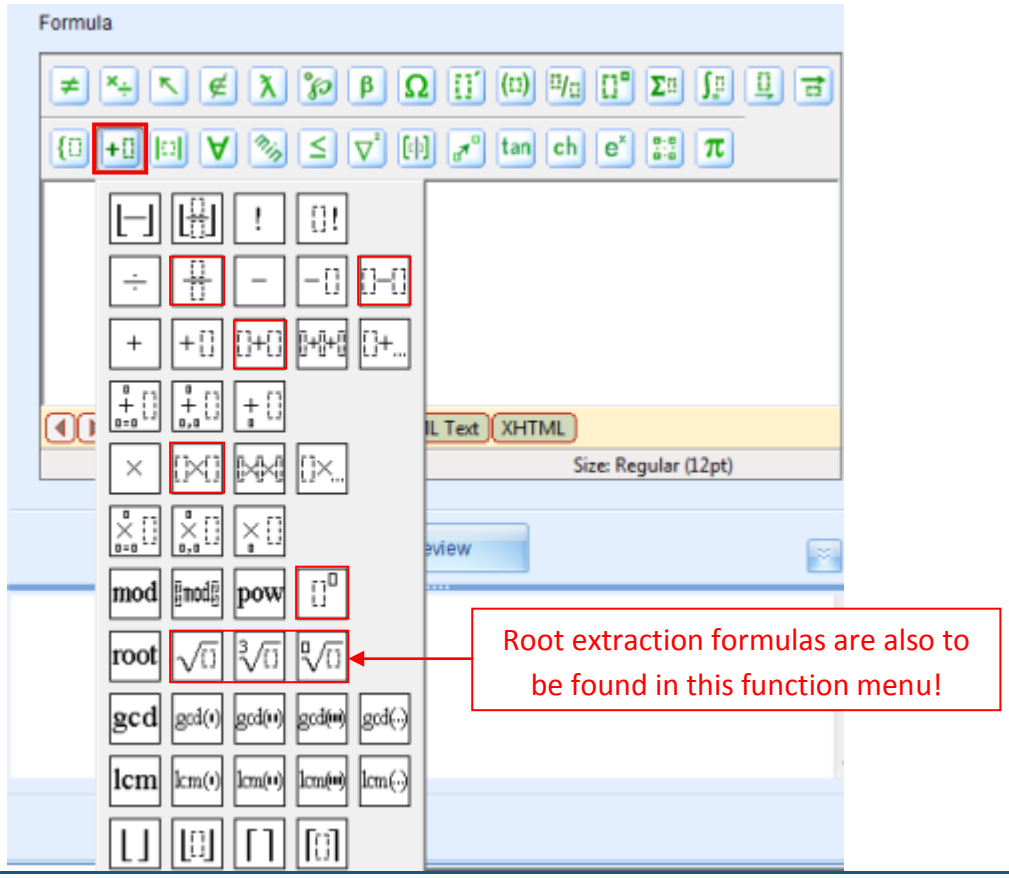
Fraction/division: by using the keyboard, insert „/” to acquire the fraction function:



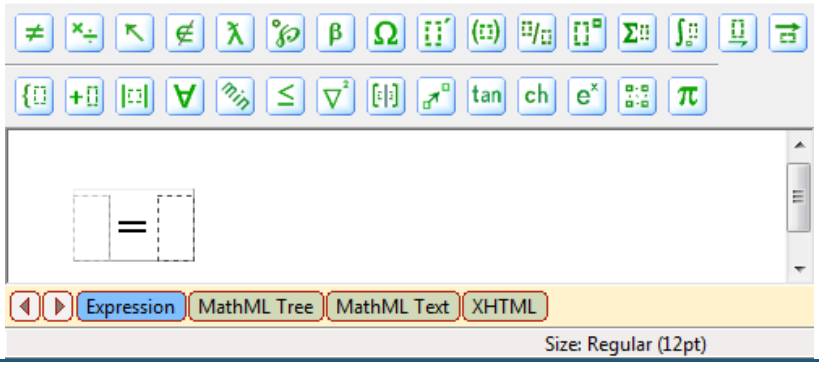
Exponentiation in power: by using the keyboard, insert „^” to acquire the power function:



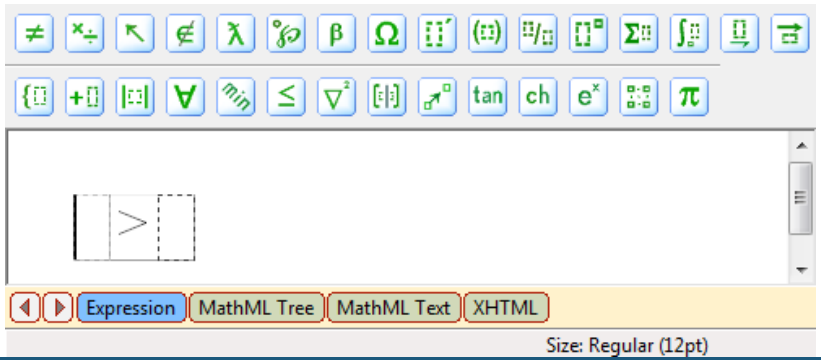
These functions can also be found in the toolbar:



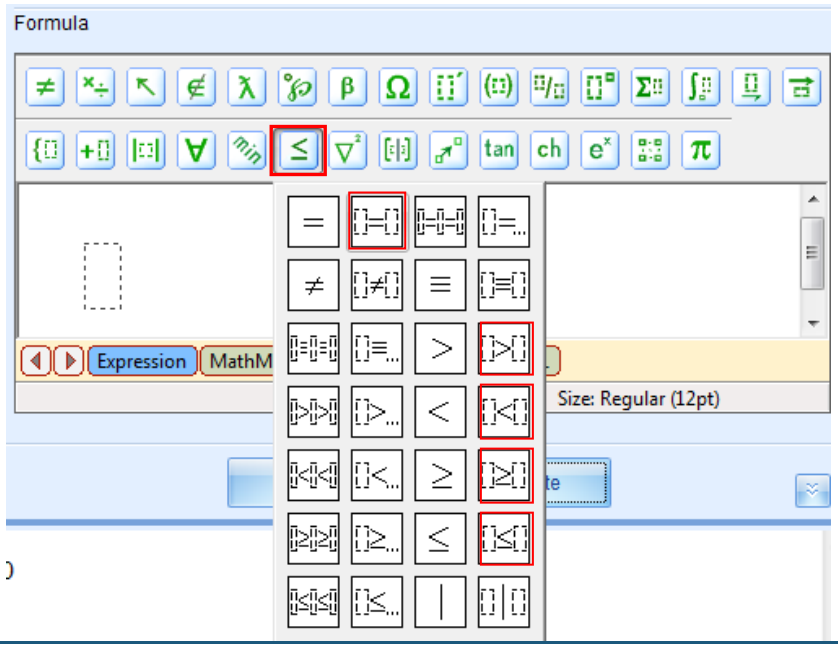
Equivalence: using the keyboard, insert **„=„** thus acquiring the equivalence function of two expressions:



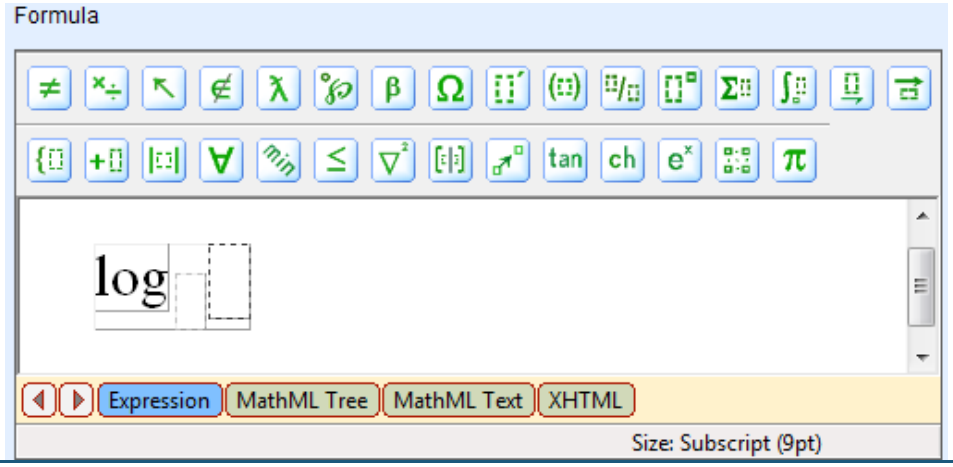
Inequalities: by using the keyboard, insert **„<"** or **„>"**, thus acquiring the corresponding inequality function.



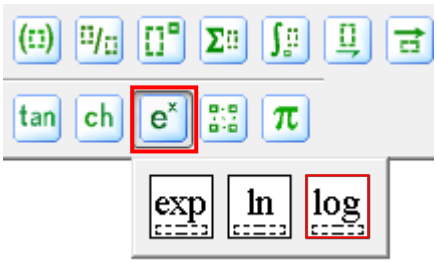
These functions can also be found in the toolbar:



Logarithms: insert „log” to acquire the logarithm function:

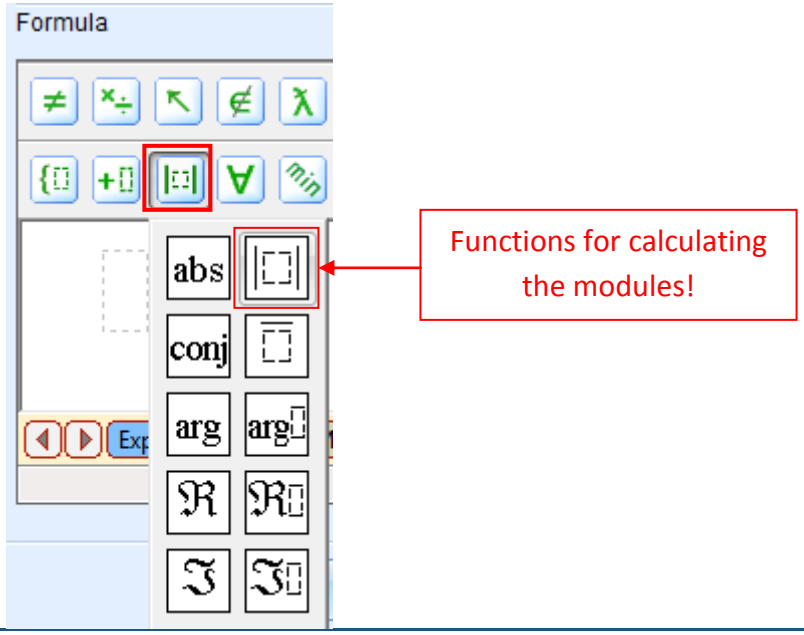


This function can also be found in the toolbar:

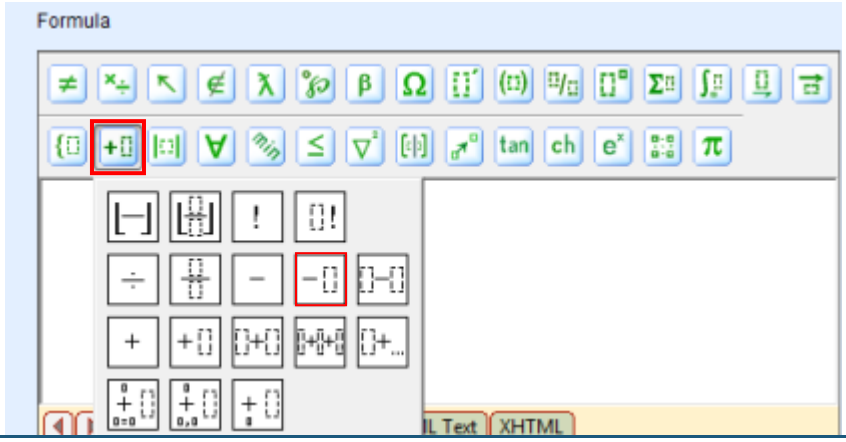


Previously mentioned are the main hot keys for inserting the Calculation formula rules but it is important to take in consideration a few more functions which are often inserted incorrectly.

The module: it is found in two places in the toolbar but only one of these functions can be used for performing a correct calculation.



Negative numbers: often when inserting a formula the negative numbers are inserted incorrectly. There is a certain function for performing a correct insertion:



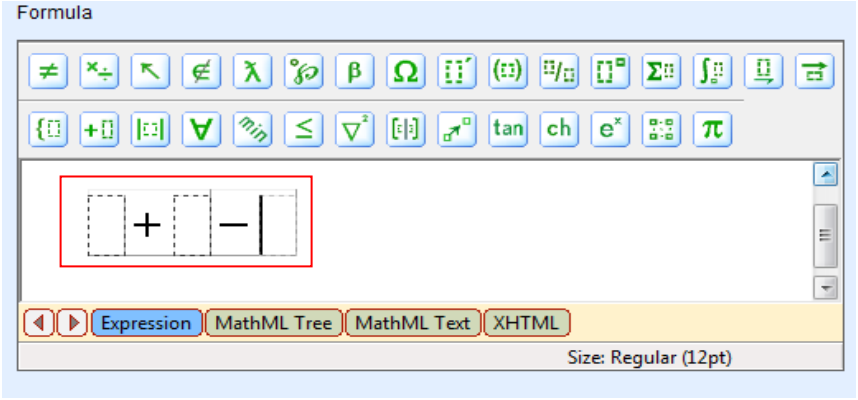
Usually for inserting the calculation formulas the user must use the lower formulator toolbar but in cases of doubt it is always advised to check the calculation.

It is very important in the calculation functions to not only use the correct mathematical functions for inserting the formula from the GenExis formulator toolbar but also to comply with the correct mutual relation of different mathematical functions and values. In order to achieve the desirable result in cases of calculation formulas **the sequence of actions is very important.** As you may have previously noticed in viewing different mathematical functions, each is defined by a flickering line rectangle combination. One expression may include several mathematical function combinations thus the layout of these rectangles is fairly complicated.

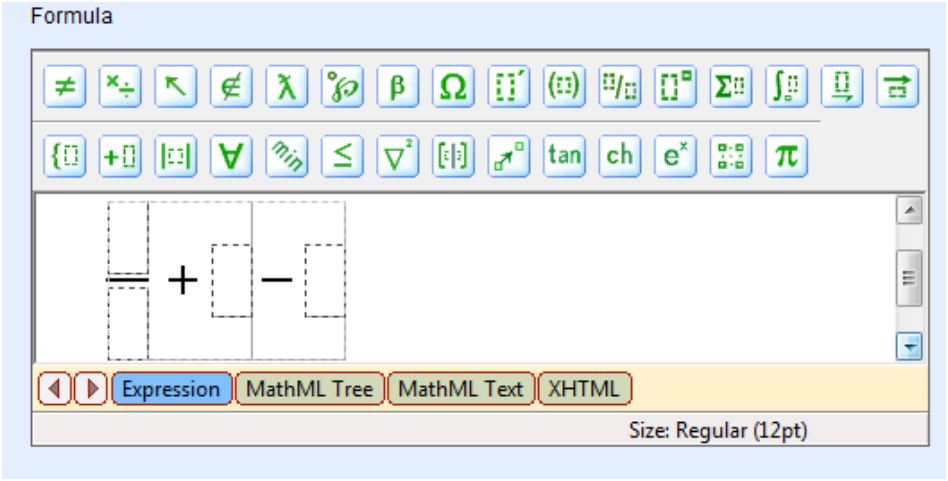
In order to better understand the creation of Calculation formulas, let's try to create such a formula by defining 3 and 4 as number rules with variable values as well as by forming the power as a number rule:

$$\frac{3}{4} + (3+4)^2 - \log_2 \frac{1}{2}$$

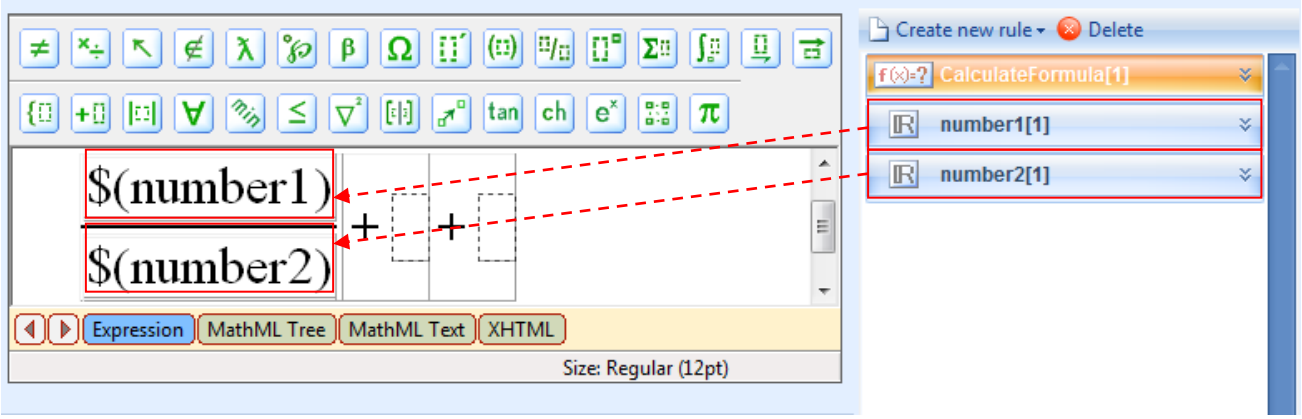
Let's assume that we've already created all necessary number rules (number 1, number2 and the power) and that they've already been defined according to our needs (see Theme 9.1). Sequentially we form a new Calculation formula rule and open it in the editing mode. Since the expression which we wish to create consists of 3 basic parts let's start by inserting the necessary basic function. Namely, let's click the cursor in the formula insertion field and by using the keyboard, insert the "+" sign; then we place the cursor at the end of the acquired addition function (so that it is not in the other rectangle but after it) and by using the keyboard insert the „- „ sign. As a result we acquire the following preparation:



When the above result is acquired we can continue inserting formula part by part, starting with the first one. Click the cursor in the first rectangle and by using the keyboard insert the „/" sign thus acquiring a fractional expression at the beginning of the total expression:



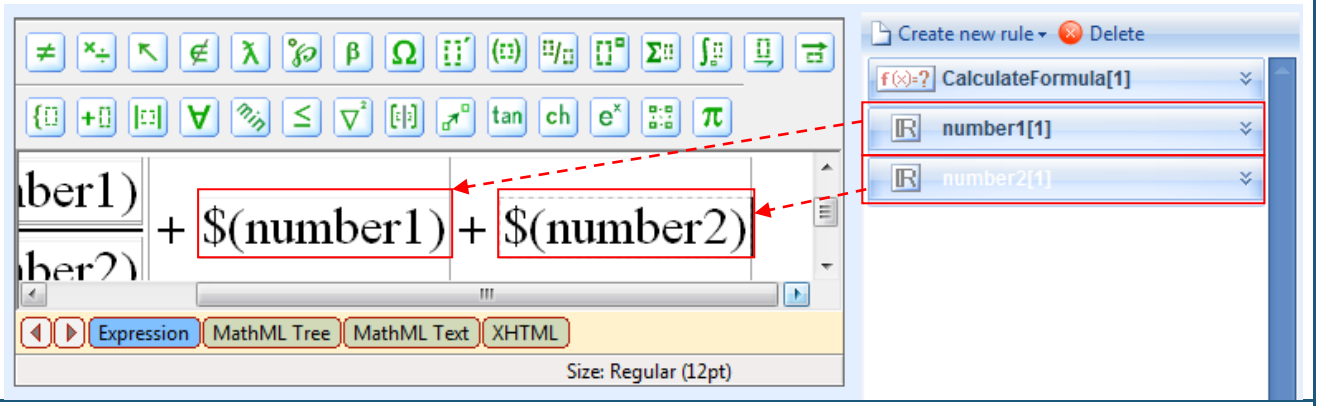
Since we wish to use the generation principle in calculating formulas then two number rules will be used in defining the fraction: number1 and number2. They can be inserted in the formula by using the "drag and drop" principle:



To drag the appropriate rules in the correct place of the formula, the cursor must be in the corresponding rectangle. Meaning, by dragging the number1 the cursor must be in the fraction

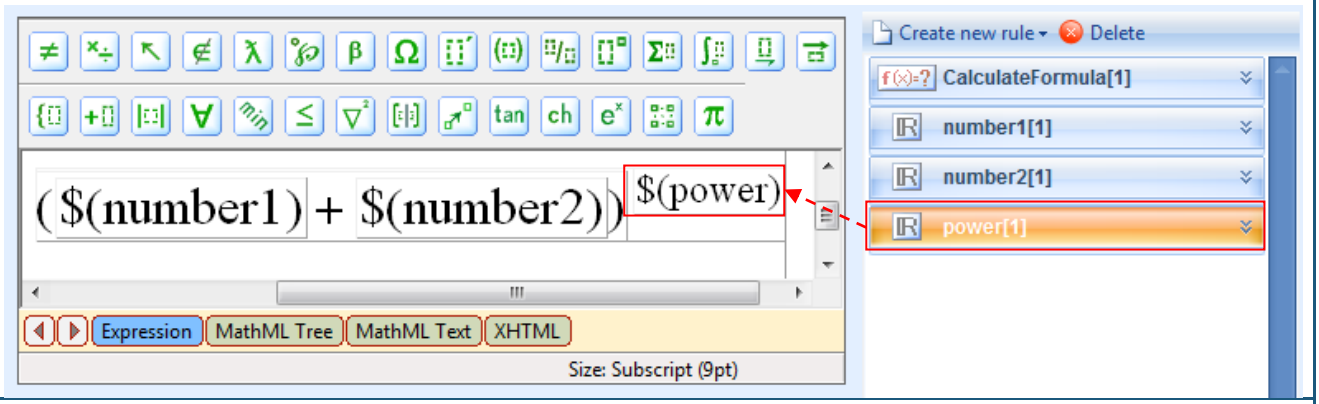
function upper rectangle (the numerator) but when dragging number2, the cursor must be in the fraction function lower rectangle (the denominator).

When the first part of the expression is successfully formed we can continue inserting the formula. Since the second part of the expression is the sum of two numbers raised in power, we must first define the sum of two numbers and then raise it to the power. This is done by clicking the cursor in the second rectangle and by using the keyboard, inserting the "+" sign. Sequentially, number1 and number2 is "dragged and dropped" in the acquired sum expression. To raise this expression in power it must first be marked:

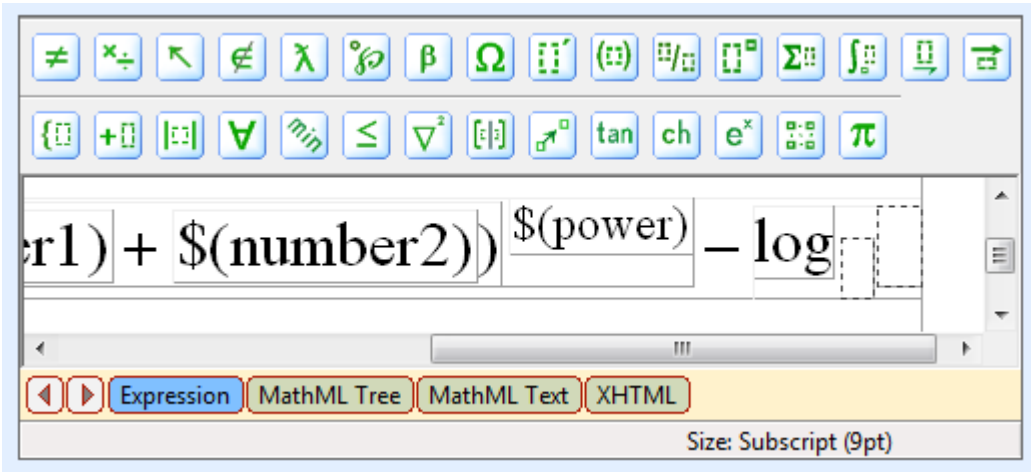


When the sum expression is marked use the keyboard to insert the "^" sign or select the power function from the toolbar (see previous). The system will automatically place the sum expression in brackets and in the right upper corner of the expression add another smaller rectangle for inserting the power.

Sequentially click the cursor in the smaller rectangle and drag in the number rule in which the power is defined:

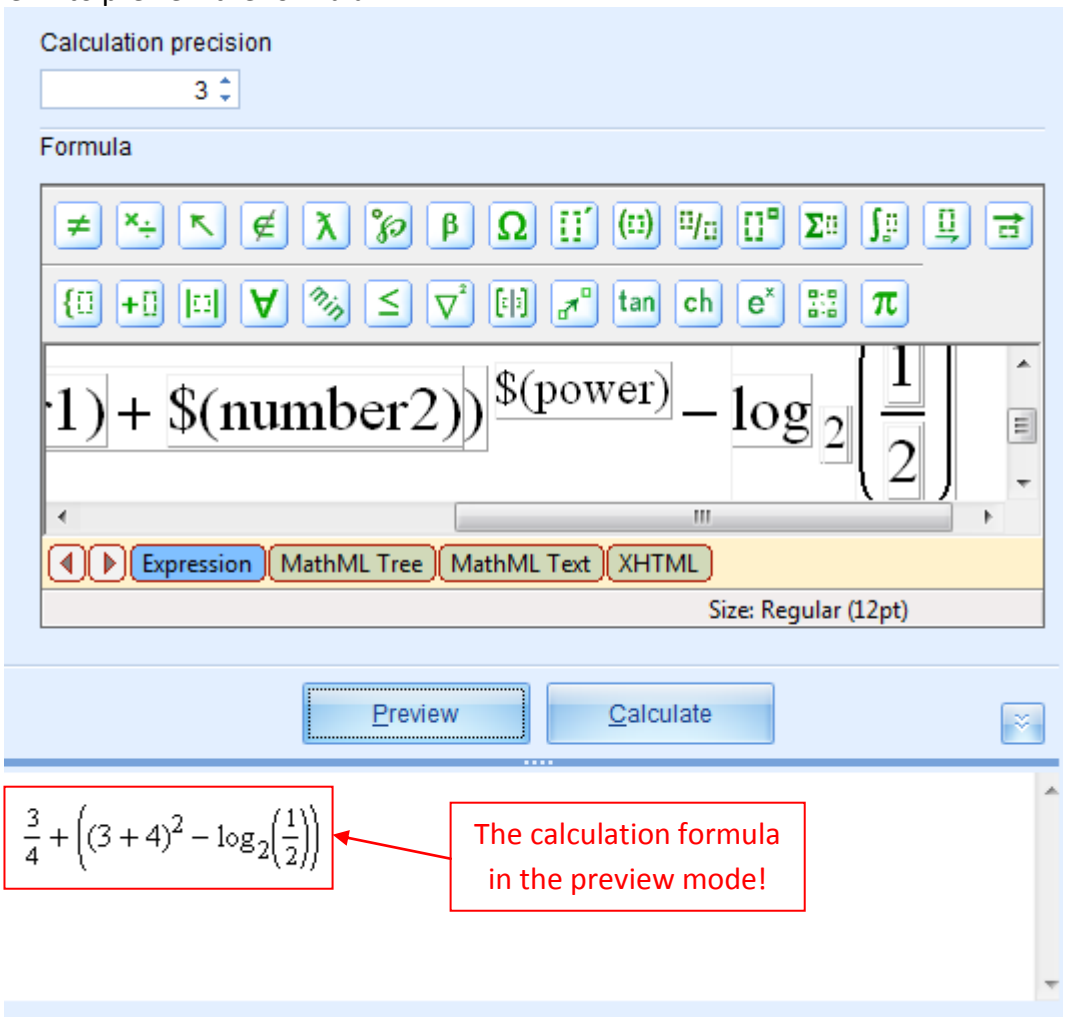


When the second part of the expression is successfully inserted we can continue inserting the third part of the formula. Click the cursor in the last empty rectangle and by using the keyboard write in "log". Sequentially the system will automatically change it to a logarithmic expression in which the logarithm base and number must be inserted for calculating the value:



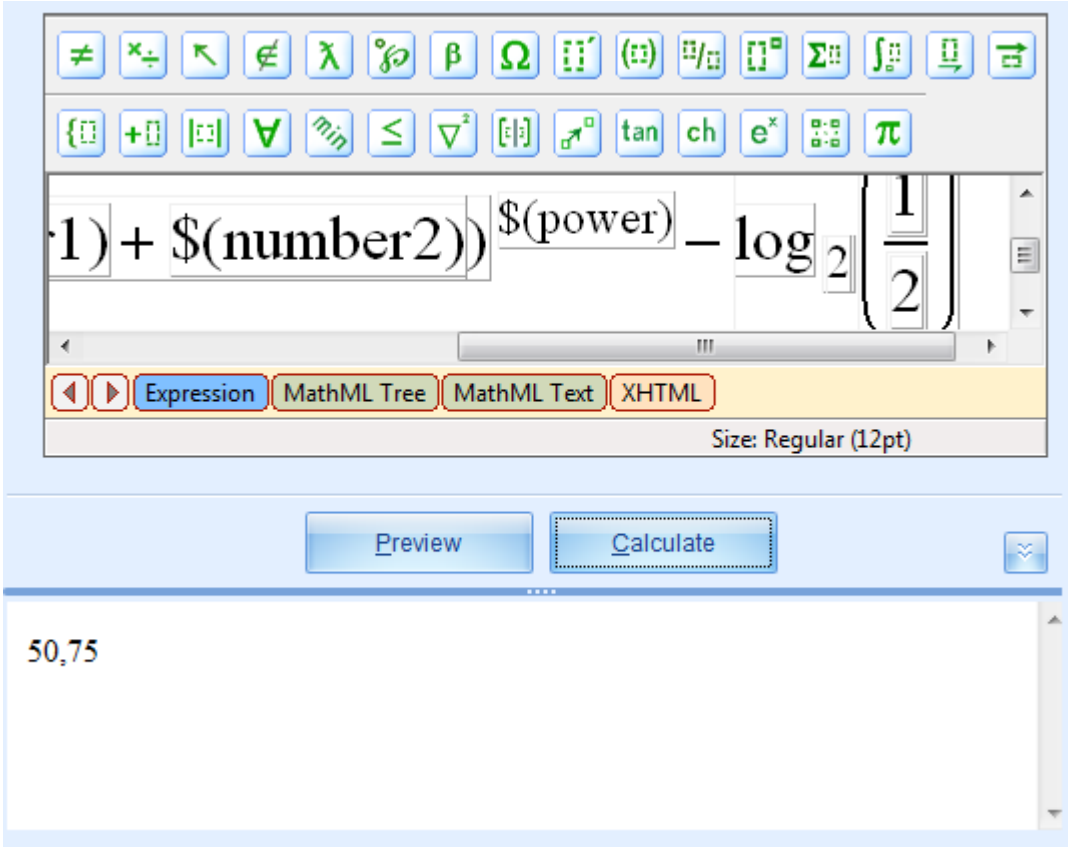
Since this time we won't be using the number rule for defining the expression, click the cursor in the logarithm base rectangle and write in 2. Sequentially click the cursor in the second rectangle, insert "/" to acquire a fractional expression and then write in 1 in the numerator and 2 in the denominator.

When this is finished we can regard this as a successful completion of the Calculation formula. Click on "Preview" to preview the formula:



As seen in this example all number rules are substituted with specific numeral values and the Calculation formula rules has automatically placed all necessary brackets to show the sequence of the actions. The Preview mode is one way to make sure that the inserted formula is correct.

When you've made sure in the preview mode that the formula is correct click on "Calculate" to preview the calculation result (don't forget to first insert the calculation precision – up to how many numbers after the coma the result should be rounded off):



If the Calculation formula won't be inserted correctly the system will not be able to perform the necessary calculation and the result will be shown as 0 (except when the result should actually be 0). To ensure that the result changes as a result of number generation, repeatedly click on "Calculate".

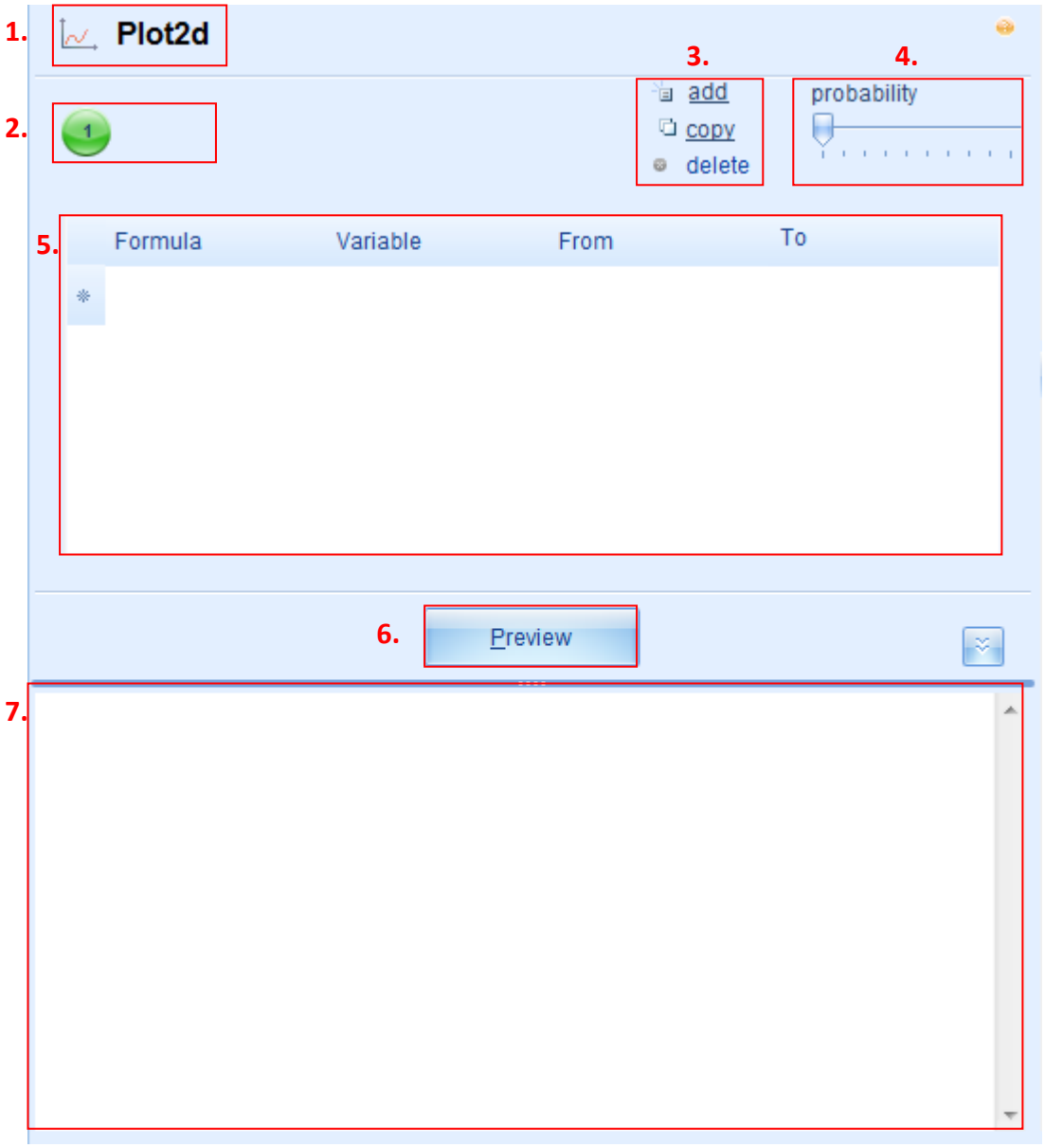
Note: this can't be considered as the only correct insertion algorithm for the given calculation formula. This can also be done in a different sequence without using the "hot keys", etc. It all depends on which way of insertion is more convenient for the user.

Note: to cancel an incorrect action the user can use the Ctrl+Z key combination.

9.7. Plot 2d

Plot 2d is used to insert two-dimensional function plots for expression with one unknown quantity in the exercise.

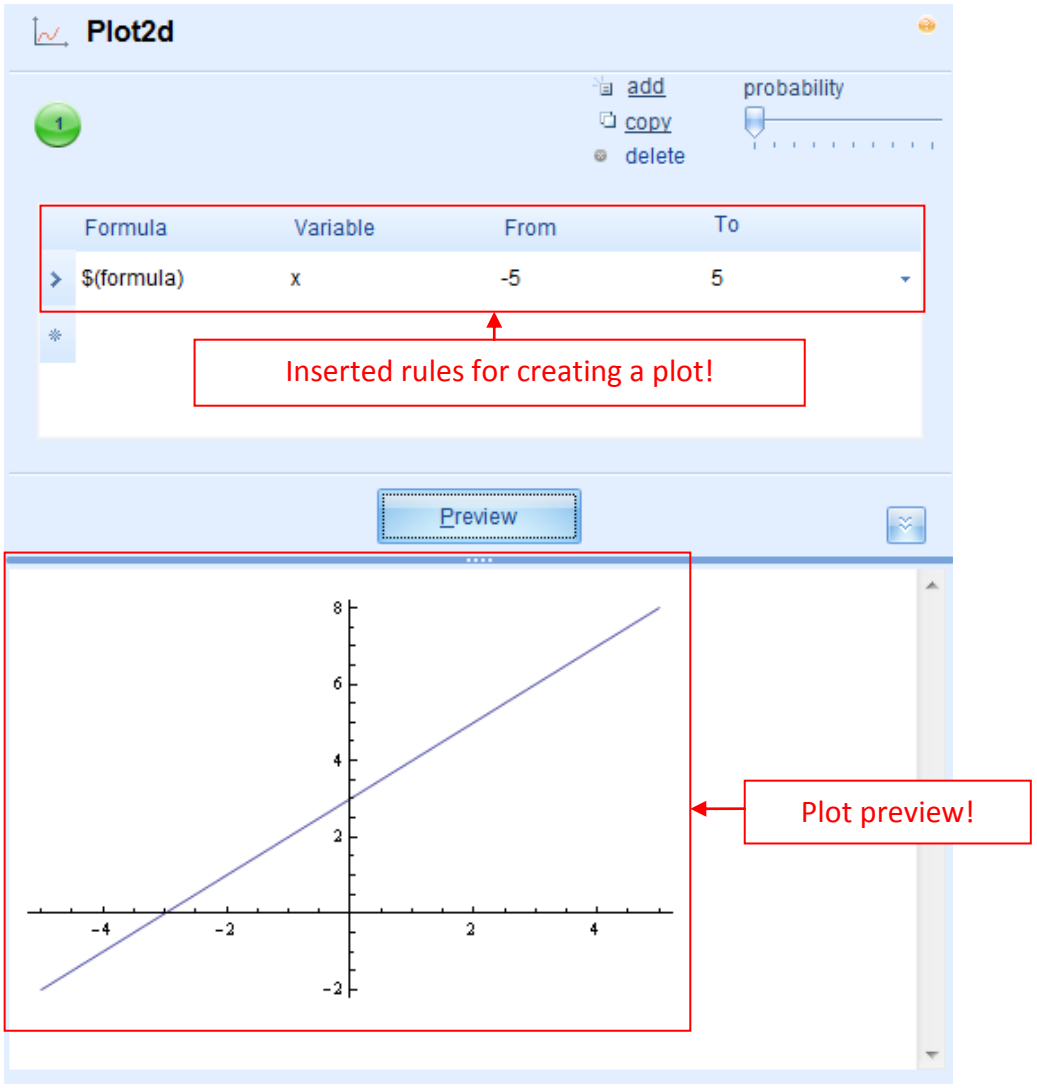
Based on the previously described steps we form a new plot 2d rule and open it in the editing mode. The editing mode shows: the rule icon and the title [1]; the number of expressions [2]; tools for adding, copying and deleting expressions [3]; the probability determination tool for the selected expression [4]; the rule insertion space for forming the plot [5]; the preview option [6]; the rule preview field [7].



The plot 2d rule doesn't have different insertion forms thus in order to insert the plot versions the user must add new expression(s). The addition of a new expression, copying and deleting an expression, as well as probability selection is done in the same way as for all the previous rules.

Creating Plot 2d: the only precondition for creating a plot 2d is creating a formula based on which the system will automatically construct a plot. The formula must be created as a Formula rule (see Theme 9.5) but in this case it is important to remember that **in creating the formula the user must use functional not representative mathematical functions from the available toolbar** (the user must use the mathematical functions meant for the Calculation formula from the formulator toolbar because the hot keys don't work in the formula rule (see Theme 9.6)). The user must also remember that when inserting a formula they don't have to insert "y=" on the left side of the expression. Meaning, if the user wishes to construct a plot for function "y=x+1", user must simply form formula rule which contains only "x+1".

When you've created a formula by which you wish to create a plot, you can open the plot 2d rule in the editing mode and start its creation. First click the cursor in the formula column and select the respective formula from the available toolbar. The system will automatically insert all other necessary rule. In case you have used a different unknown quantity, not "x", in the formula, you must make corrections in the "Variable" column by inserting the correct unknown quality symbol (the one used in the formula) or select the respective variable name rule. Sequentially you can also change the value layout.

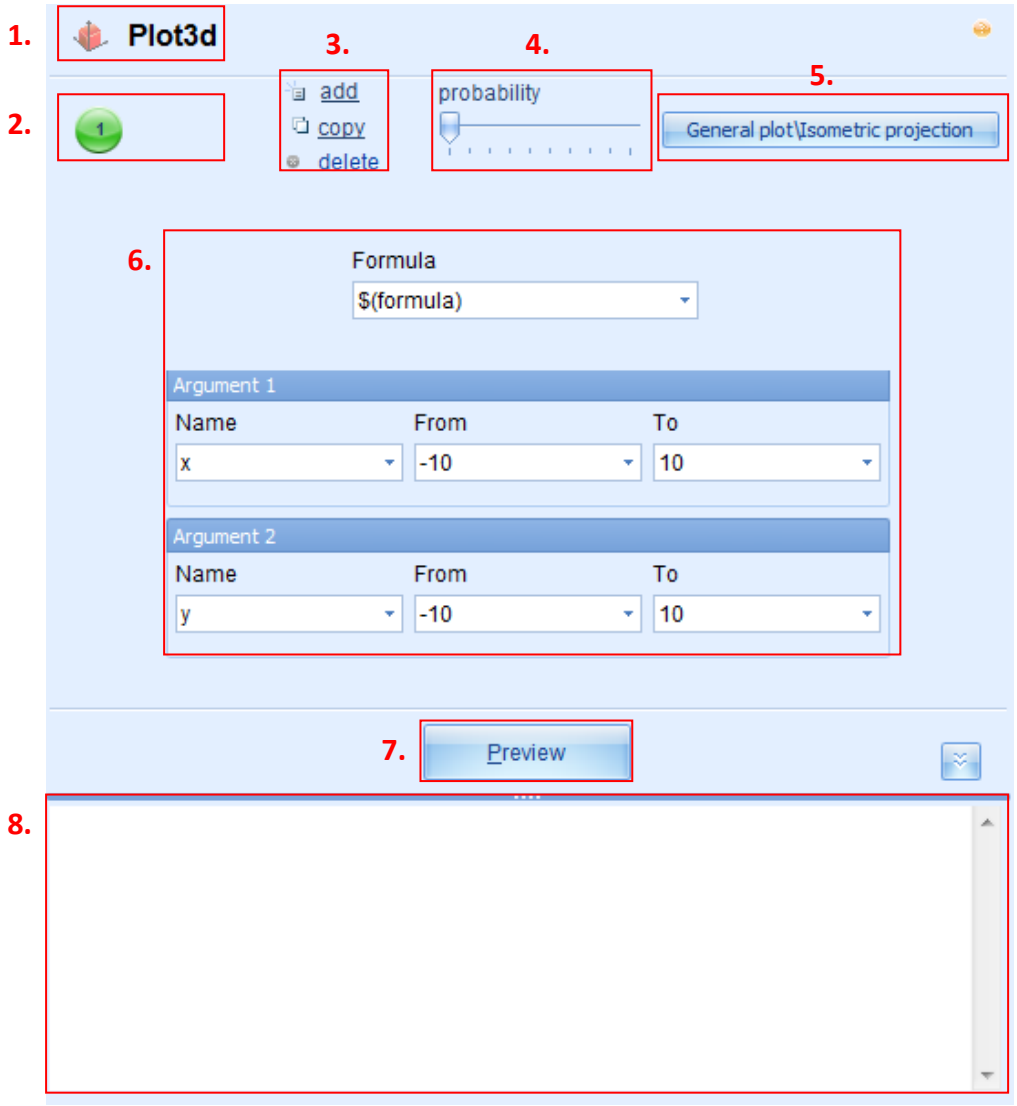


When you've inserted all setup options click "Preview" to view the plot. If you've inserted more than one formula version in the given formula rule then you can view the plot generation by repeatedly clicking "Preview".
If the formula rule will be created incorrectly the system won't create the plot or will create it incorrectly.

9.8. Plot 3d

Plot 3d is used to insert three-dimensional function plots for expression with two unknown quantities in the exercise.

Based on the previously described steps we form a new plot 3d rule and open it in the editing mode. The editing mode shows: the rule icon and the title [1]; the number of expressions [2]; tools for adding, copying and deleting expressions [3]; the probability determination tool for the selected expression [4]; the form of the plot 3d and its toolbar [5]; the rule insertion field for forming the plot [6]; the preview option [7]; the rule preview field [8].



The plot 3d rules system offers several versions: General plot/isometric projection; Parametric plot/isometric projection; Parametric plot/X projection; Parametric plot/Y projection; Parametric plot/Z projection. The main difference between the general plot and the different parametric plots is that in the general plot you must insert one formula with two unknown quantities but in the parametric plot the system will ask to insert 3 formulas with two unknown quantities (in all three formulas the unknown quantities must be equal, meaning if the first formula includes unknown

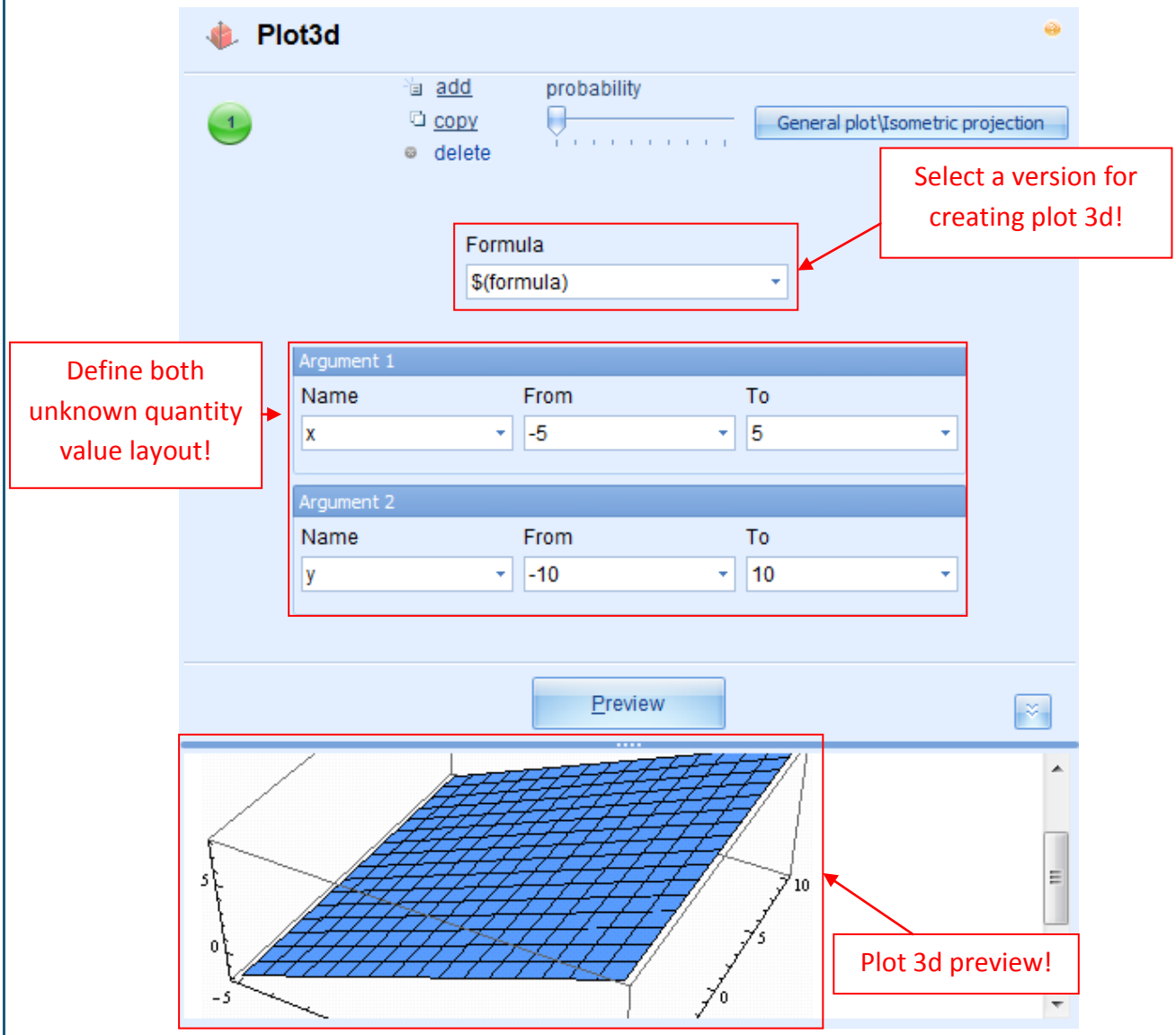
quantities x and y then the second and the third formula must also include unknown quantities x and y).

The plot 3d version can be changed by clicking on the button with the current plot version name and selecting the necessary version in the offered menu.

The plot 3d rule doesn't have different insertion forms thus in order to insert the plot versions the user must add new expression(s). The addition of a new expression, copying and deleting an expression, as well as probability selection is done in the same way as for all the previous rules.

Creating plot 3d: same as with plot 2d rule the only precondition for creating a plot 3d is the creation of formula(s) based on which the system will automatically construct a plot. The formula must be created as a formula rule (see Theme 9.5) but in this case it is essential to remember that you must use the functional not representative mathematical functions (see Theme 9.7 and 9.6).

Since basically the insertion of settings for all plot 3d versions is done in a similar manner, let's overview the plot construction of the most frequently used General plot / Isometric projection:



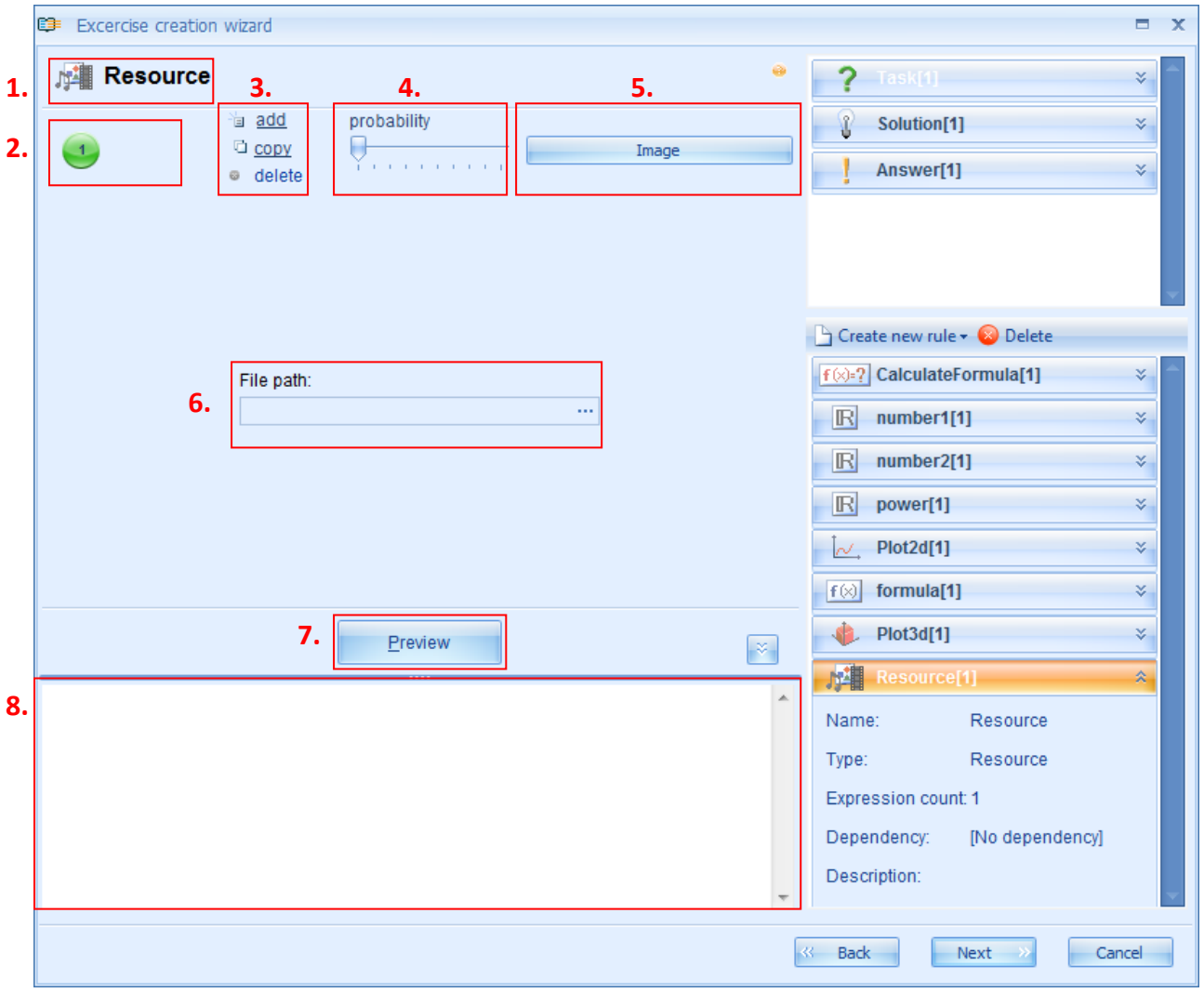
For parametric plots you should select 3 formulas based on which to create the plot.

Note: if you've used other unknown quantities (not "x" and "y") in the formula (s) you must correct these in the Argument name column by inserting the correct unknown quantity (the one used in the formula) or by selecting the adequate variable name rule. Sequentially you can also change the value layout.

Note: if the formula rule will be created incorrectly the system won't create the plot or will create it incorrectly.

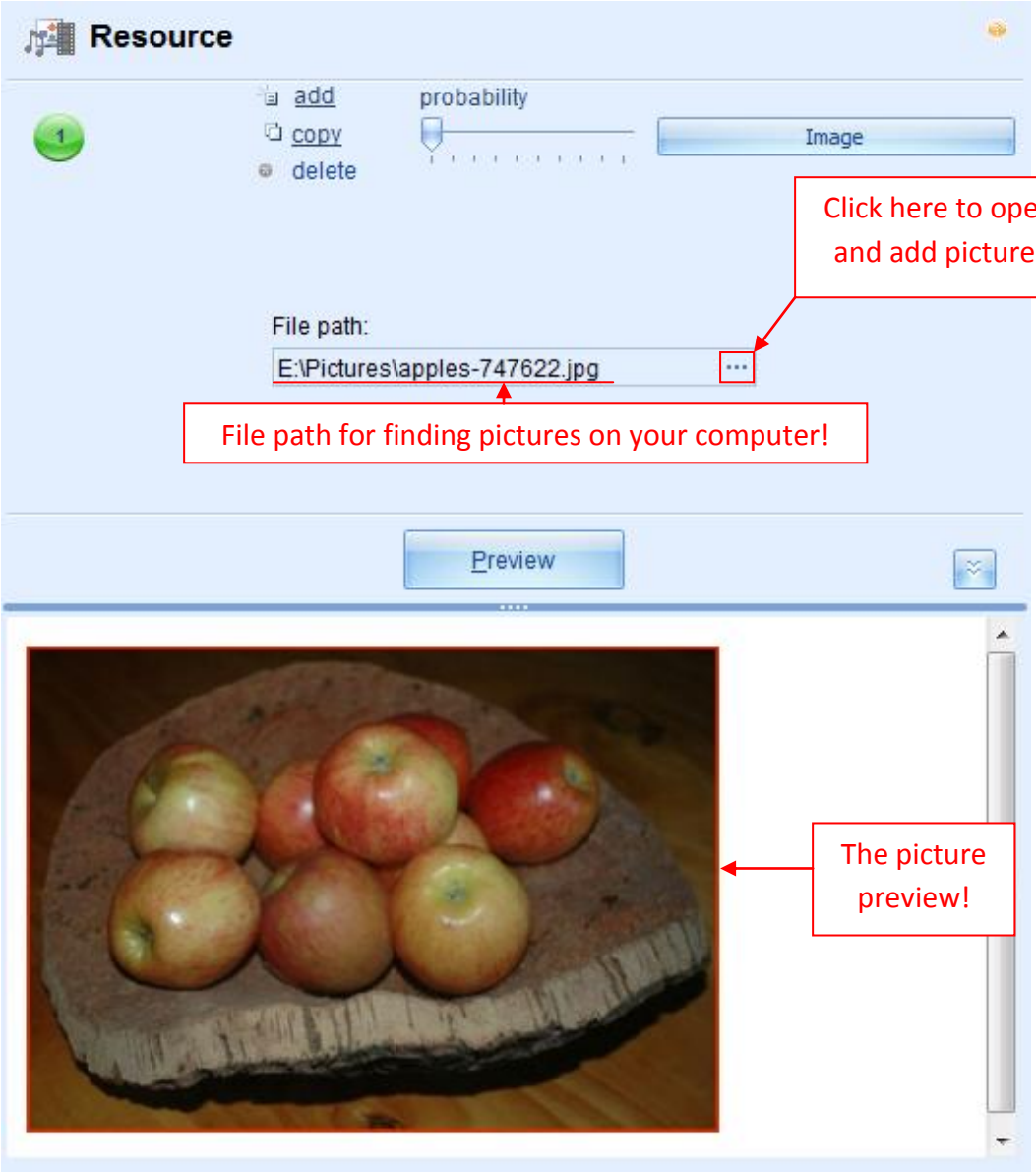
9.9. Resource

The GenExis system uses the resource rule to add pictures or files for download in the exercises. Based on the previously described steps we form a new resource rule and open it in the editing mode. The editing mode shows: the rule icon and the title [1]; the number of rules [2]; tools for adding, copying and deleting expressions [3]; the probability determination tool for the selected expression [4]; the form of resource [5]; the resource upload tool [6]; the preview option [7]; the rule preview field [8].



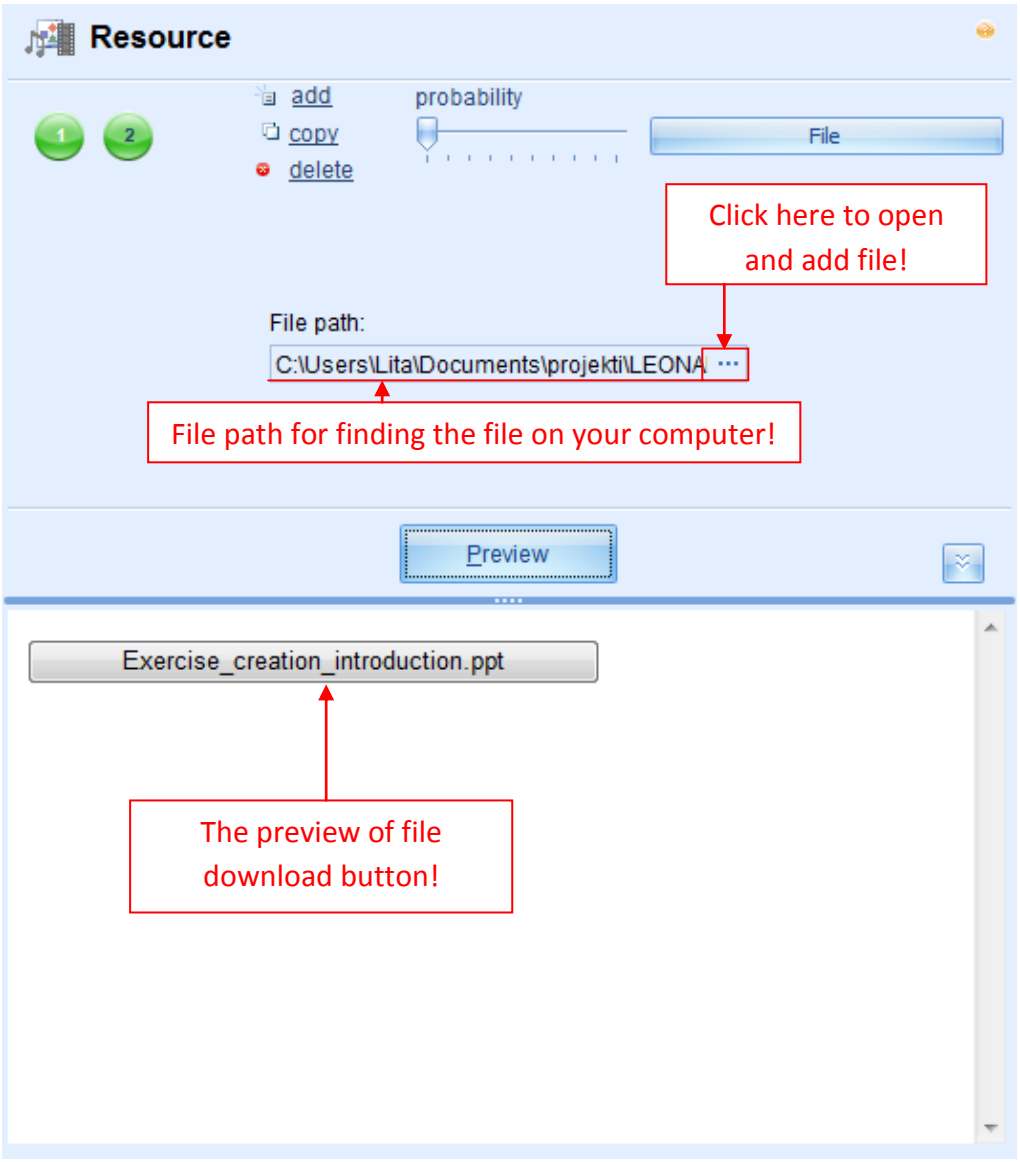
Currently there are two types of the resources rule (the type can be changed the same way as with number rule): image and file, thus it is possible to upload pictures (drawing, photos, etc.) or any type of document (file) that can be added as an attachment to task or solution. To add several pictures or several files to one rule you must create several rule expressions. The addition, copying and deletion of expressions, as well as probability defining are done in the same manner as with all the previously described rules.

Resource (picture) upload is simple: to open the file browser on your computer click on "…" at the end of the file path field. Find the necessary picture through the browser and select it to add to the rule by double-clicking on it or with the opening function.



After finding and adding the picture you can preview it by clicking "Preview". **Note**: the picture must already be in the necessary size and formed based on your needs before you upload it because the GenExis system doesn't offer any resource editing tools. In case the picture needs to be reduced you can do this through another programme and then add it to the exercise

Resource (file) upload happens the same way as picture upload: to open the file browser on your computer click on "…" at the end of the file path space. Find the necessary file through the browser and select to add it to the rule by double-clicking it or with the opening function.



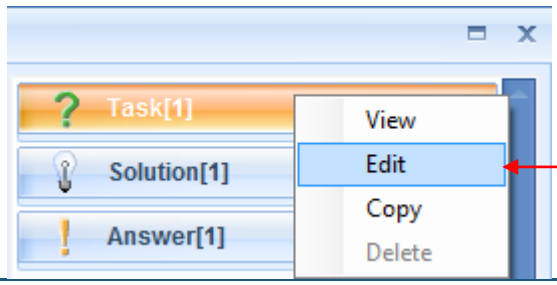
When clicking on Preview, a button for file download will appear (it will have file name on it). By clicking on this button, user will be able to save this file on his/her computer.

Note: the GenExis system will not allow you to add large pictures or files (you shouldn't add pictures larger than 1,5 MB). In case the selected picture will be too large, the system will show the error in the automatic saving process and won't allow you to save the exercise with this resource file.

When you've successfully created the resource rule you can use it as an addition to the exercise question section, the solution process or the answer!

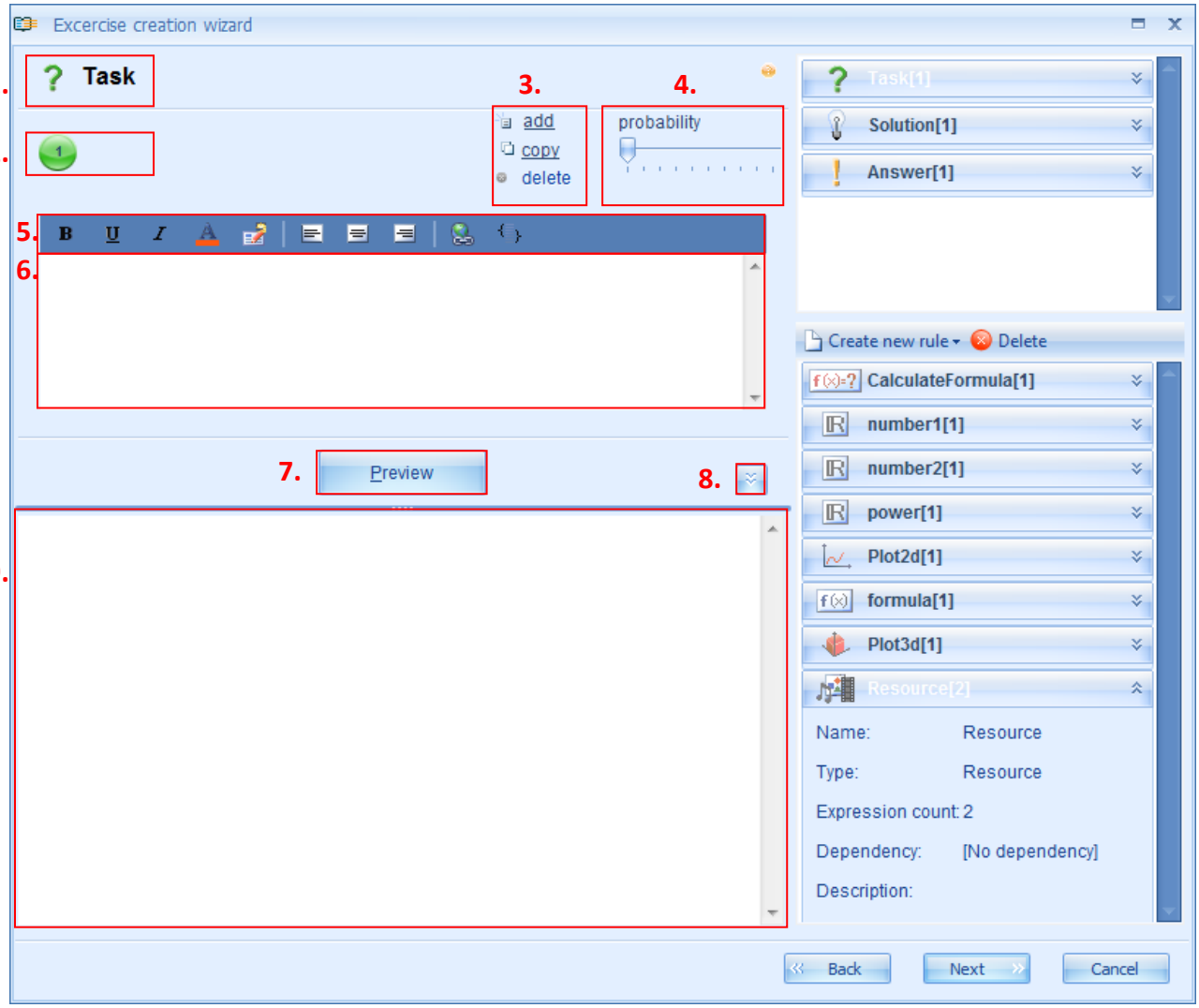
Theme 10: How to create a new exercise – task formation

In order to enter a question or exercise task, the task input editor has to be opened. It can be done by double-clicking on „Task" or moving the mouse cursor on „Task" and pressing the right mouse button and selecting „Edit" from the offered menu.



With double-click or choosing „Edit", close the question input editor!

The task input editor will open in a while:



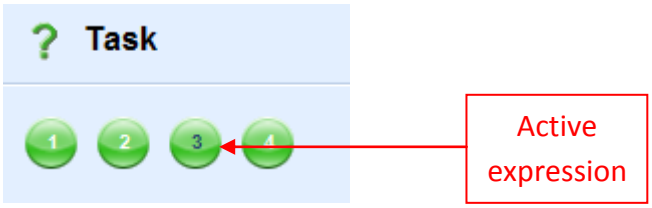
The task input editor consists of several elements:

1. Section name and icon;
2. Number of expressions;
3. Tool for adding new expressions, copying or deleting expressions;

4. Tool for setting the probability;
5. Toolbar for editing the answer content;
6. Field for entering question content;
7. Preview button;
8. Button for expanding and shrinking the preview pane;
9. Preview pane.

Adding a new expression: A single task can contain more than one expression. In order to add new expression click "add" [3] – the system will immediately add a new, empty expression to the section.

In the same way the user can add the necessary number of expressions to ensure the generation process. In order to edit or delete any expression, the particular expression has to be activated or highlighted. The ordinal number of the activated expression changes its color from white to black at the moment when selected.

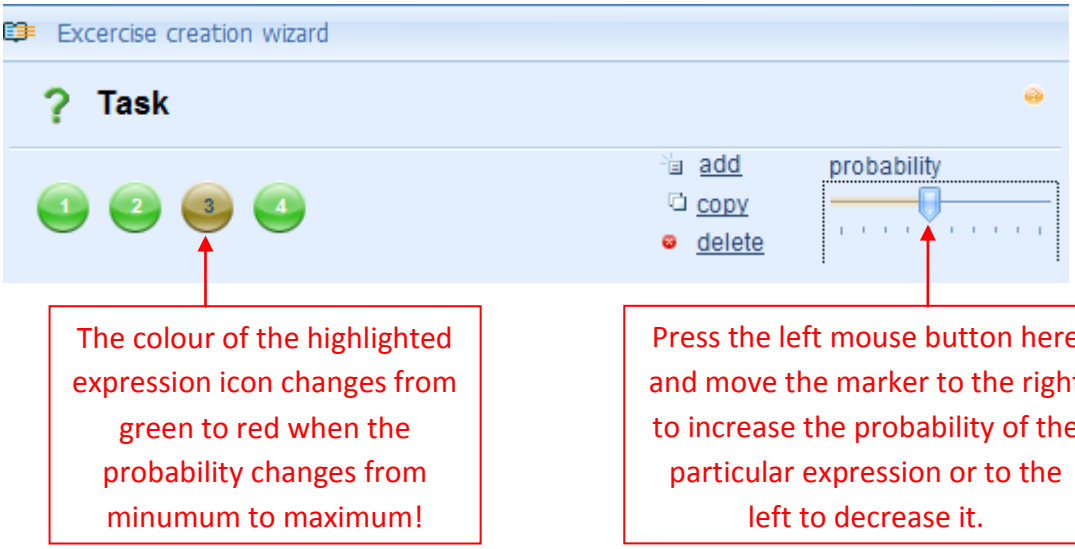


Copying expression: When the expression is activated it is possible to copy it by clicking on „copy". The system will automatically generate a new expression and add it at the end of the expression row. Its type and content will be identical to the copied expression [3].

Deleting expression: When the expression is activated it is possible to delete it by clicking on „delete" [3].

Setup of expression probability: if the question has several expressions then it is possible to determine the probability how frequent the particular expression (question type or formulation) will appear to the user when launching the task.

The expression with the highest probability will appear more frequently than the others in the exercise generation process outcome.

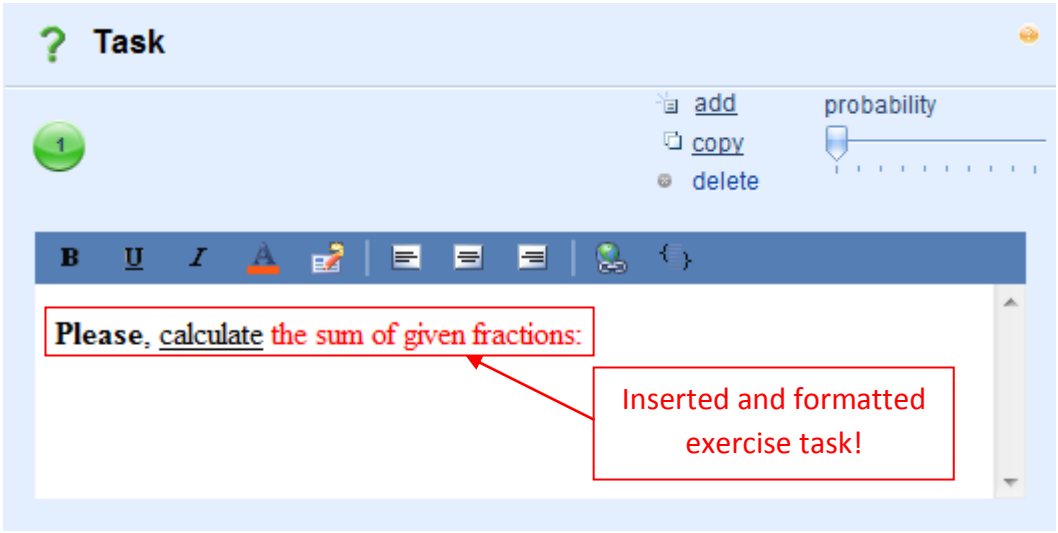


Toolbar for editing content: a simple toolbar with understandable functions is offered to allow the users to edit the content of the task according to their needs.

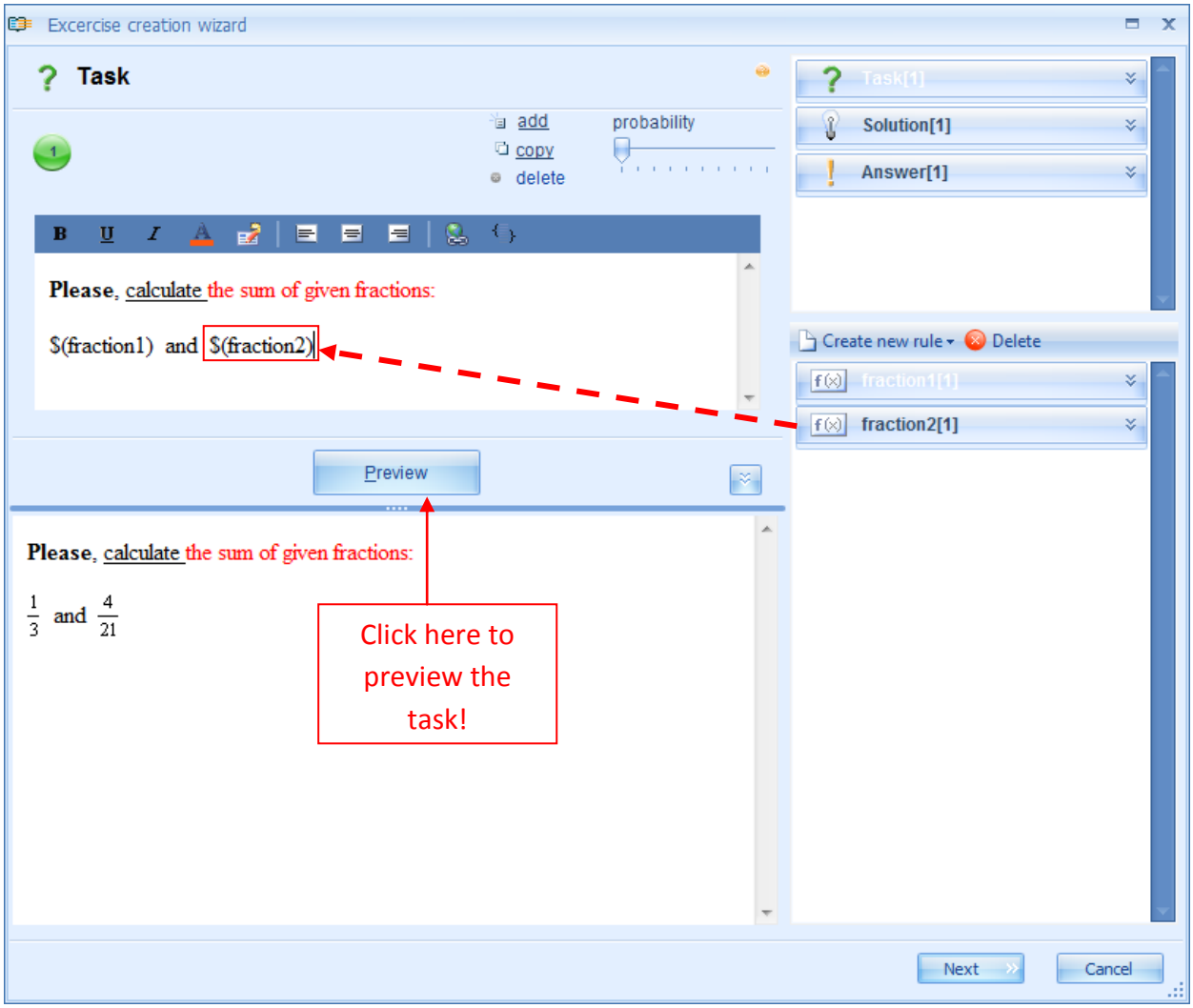
1.-3. Functions 1.-3. ensure the display of content elements (text, number, formula) in bold [1], underlined [2] or Italic [3] style. Function 4. allows changing the color of the particular element. The positioning elements in the content can be edited by centering the text [7], aligning the text left [6] or aligning the text right [8]. It is also possible to add a hyperlink into the content [9].

The toolbar can be adjusted to the needs of each user by using the icon 5. By pressing the right mouse click on this icon the function „Customize...” will be offered and when selected allows the users to edit toolbar`s settings. For more sophisticated editing of content the HTML code can be used [10] but using it requires specific knowledge that is not discussed in these guidelines.

Input of task content: the input of task content initially is done in the empty field [6] under the content editing toolbar. The user can enter the text in this field by typing or using copy/paste. After entering the text it is possible to format it by using the functions available in the toolbar.



To add something to the task content, it is possible to use different type of rules. In order to add any of created rules to the exercise content the users have to use the „drag and drop” principle. It means that the users have to choose the necessary rule from the available list or create a new one (see Theme 9), press the left mouse button on it, drag the rule into the field for inserting the exercise content. When the rule is being dragged into the exercise content field, the symbol „+” will appear next to the mouse cursor. When the user will let go the left mouse button the rule will be „dropped” and displayed using symbols (containing the name of rule).



It is possible to drag several rules, write text between them and it is also possible to format them by using the available tools.

Preview: in order to preview the task click „Preview”. The text and rules entered by the user will appear in the preview pane. Besides, the rules will not be displayed as symbols or designations characterizing the particular rule but their content will be shown (according the settings of the rule). It is possible to observe the generation principle of the rules added to the question (if the rule was defined with variations) by repeatedly clicking on „Preview”.

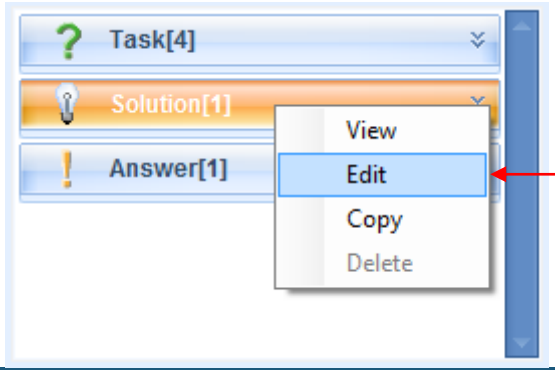
Note: the variations of question expressions cannot be verified in this mode (the preview appears to each question expression separately).

Shrinking or enlarging the preview pane: to make the input of question content more convenient (if there is a large amount of exercise text to enter), it is possible to shrink the preview pane by clicking on  [8]. It is possible to expand the preview pane by clicking this button again (in this case the arrows on the button will be directed upwards) or by clicking on „Preview”.

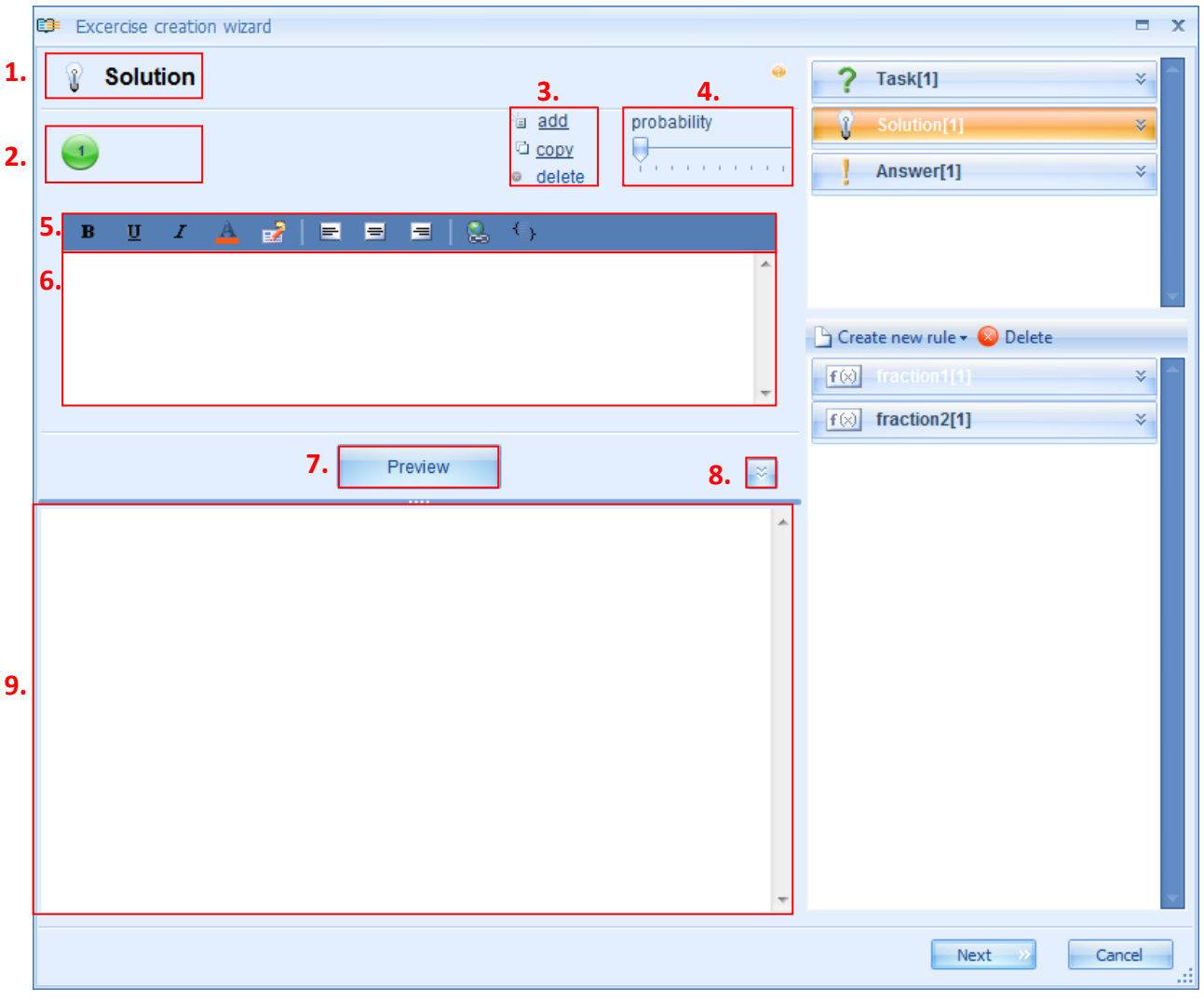
When the user has entered all the necessary exercise rules, edited them according to their needs, as well as has remained satisfied with their appearance in the preview mode, it is possible to move on to creation of the step-by-step solution (Theme 11) or the answer (Theme 12).

Theme 11: How to create a new exercise - creation of step – by – step solution

In order to insert the solution process the user will have to open the exercise creation wizard. It can be done by pressing double-click on „Solution” or moving the mouse cursor to „Solution”, pressing the right mouse button and choosing „Edit” from the given menu.



Solution editor will open in a while:



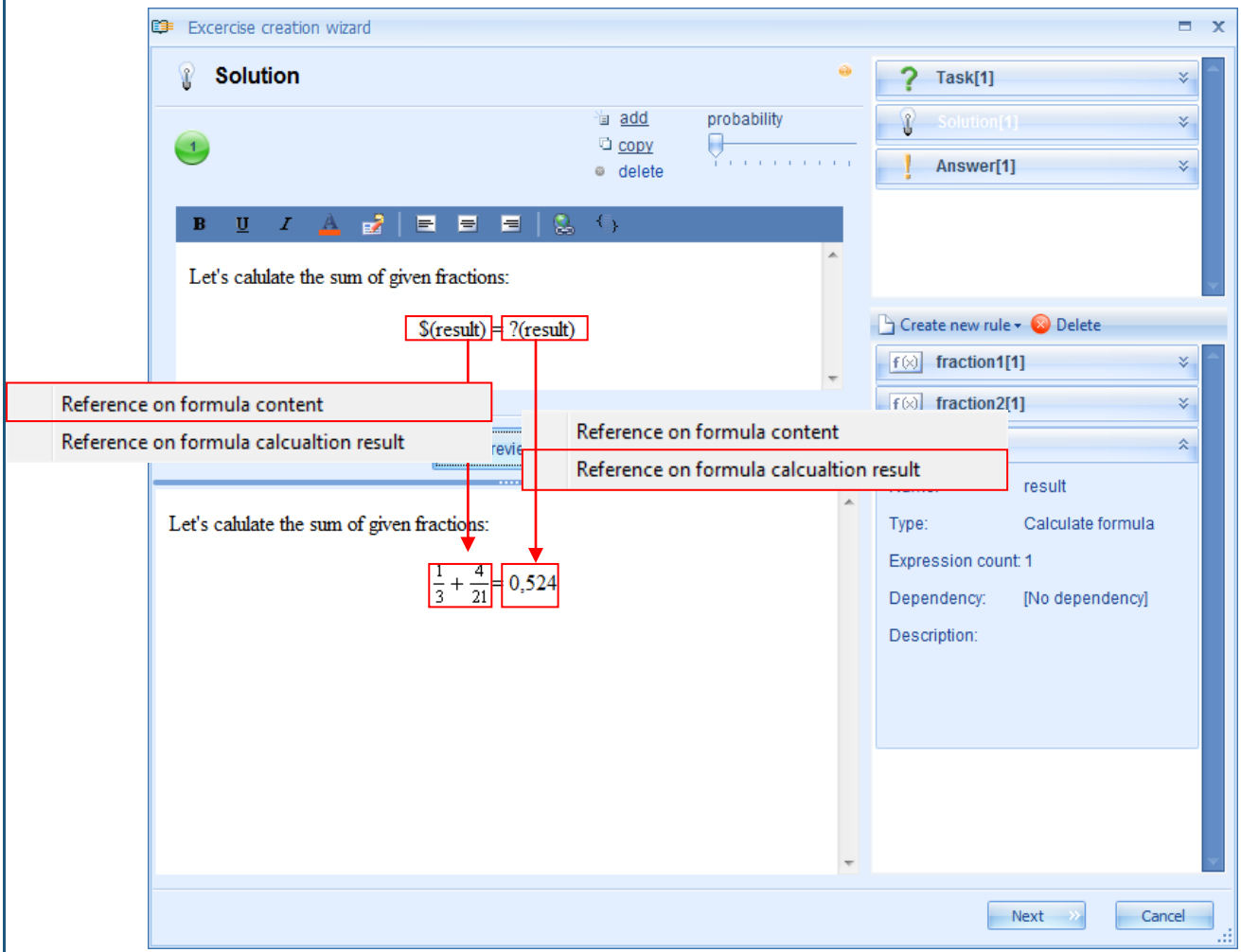
The elements of Solution editor are the same as those of Task input editor:

1. Title and icon of the section;
2. Number of expressions;
3. Tool for adding new expressions, copying or deleting expressions;
4. Tool for probability setup;
5. Toolbar for editing the content of solution process;
6. Field for entering the content of solution process;
7. Preview button;
8. Button for shrinking and expanding the preview pane;
9. Preview pane.

Solution input editor does not differ from task input editor according to their functions, wherewith the same rules and qualities already described in the task input section must be applied (Theme 10).

The type and form of Solution input depends on the user`s choice but it is advisable to create this section as a step-by-step approach to issue solving, giving the student the theoretically and practically grounded explanation helping to find the correct answer.

When entering the solution process of mathematical exercises it is essential to remember that rule



Calculate formula can be used likewise for displaying calculations and the calculation result

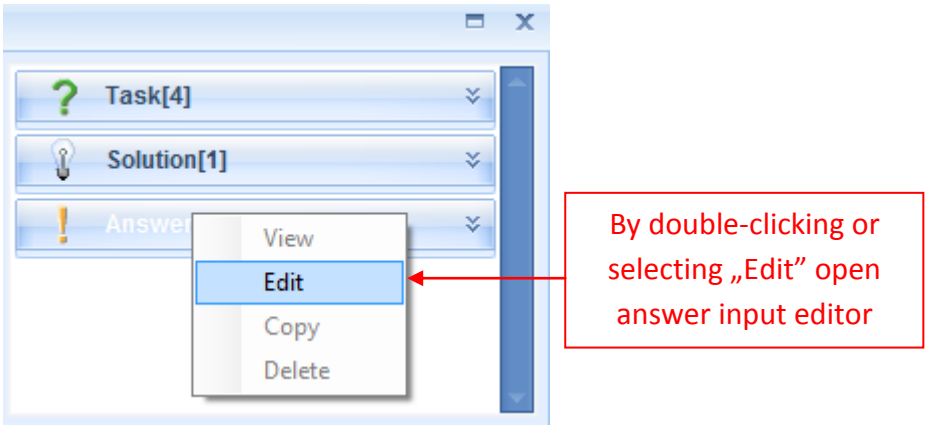
(wherewith there is no need to create two different rules). By dragging the rule Calculate formula into description of the rule solution, the system allows choosing whether to create a reference to the formula content or formula result. The display of both of these types of rule appearance differs ($(rule_title) indicates the display of contents: ?(rule_title) indicates the display of calculation results).

Note: in order to display long and complex mathematical formulas it is more convenient to use the Formula rule not Calculate formula.

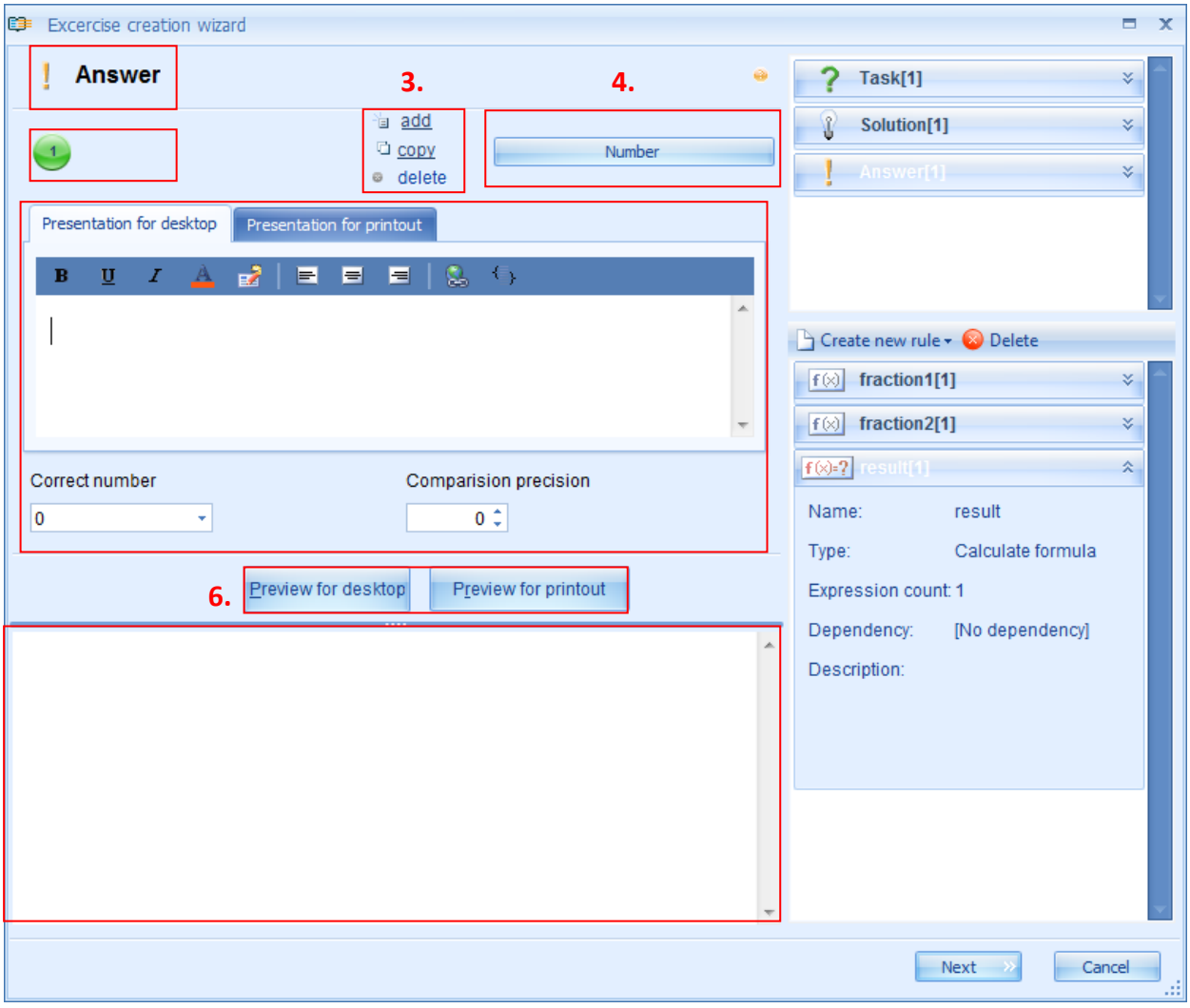
It is valuable to add pictures to the Solution (especially in tasks of geometry) as well as references (hyperlinks) to the internet resources for additional study of the theoretical material.

Theme 12: How to create a new exercise – answer formation

To enter the exercise answer the user has to open the answer input editor. It can be done by double-clicking „Answer” or moving the mouse cursor and pressing the right mouse button on „Answer” and choosing „Edit” from the given menu.



Answer input editor will open in a while:



Answer input editor consists of several elements:

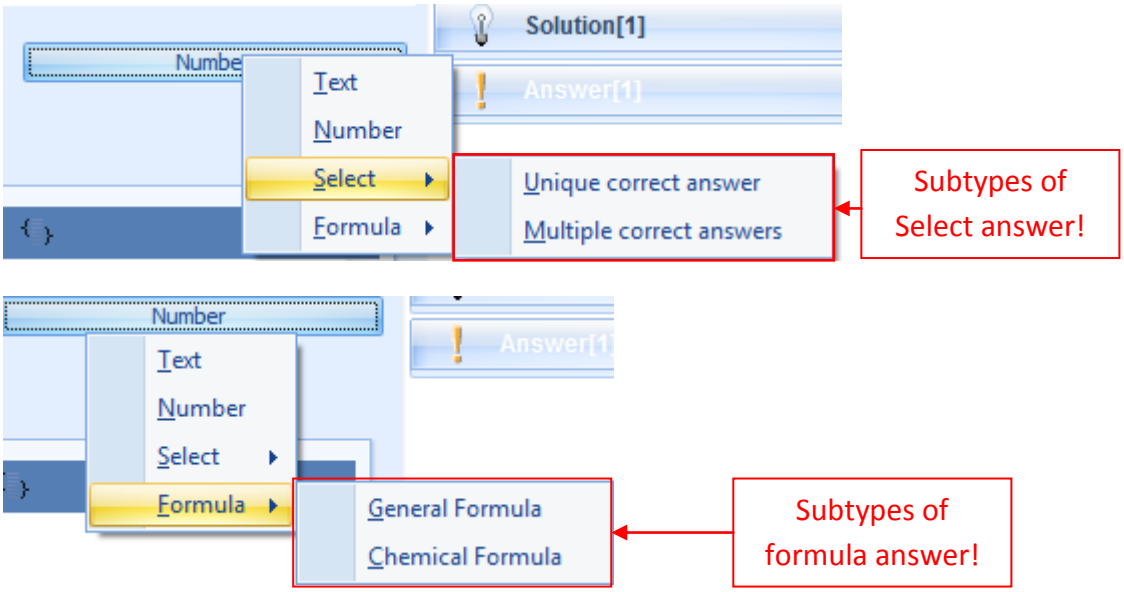
1. Title and icon of the section;
2. Number of expressions;
3. Tool for adding new expressions, copying or deleting expressions;
4. Tool for choice of answer type;
5. Toolbar for editing the answer content (it differs for each answer type wherewith will be displayed in details next to each answer type);
6. Preview buttons;
7. Preview pane.

Adding a new expression: one exercise can have multiple answers. In order to add one more answer, click „add" [3] – the system will immediately add a new, empty expression to the answer section. The number of new expressions to be added depends on how many answers the user wishes to define for the specific task. In order to edit the content of any of expressions or delete it the particular expression must be activated or highlighted (likewise as in the question input or solution process section). The ordinal number of the activated expression changes its color from white to black at the moment it is being selected.

Copying of expression: when the expression is activated it is possible to copy it by clicking on „copy". The system will automatically create a new expression and add it at the end of the expression row. Its type and content will be identical with the copied expression [3].

Deleting of expression: When the expression is activated it can be deleted by clicking on „delete" [3].

Answer type menu: it is possible to create four different types of answers to the exercises – text, number, select (with unique or multiple correct answers), formula (general formula or chemical formula). In order to choose the proper answer type, click the left mouse button on the title of the existing answer type [4] and select the necessary option from the offered ones (the select and formula type of answers have subtypes).

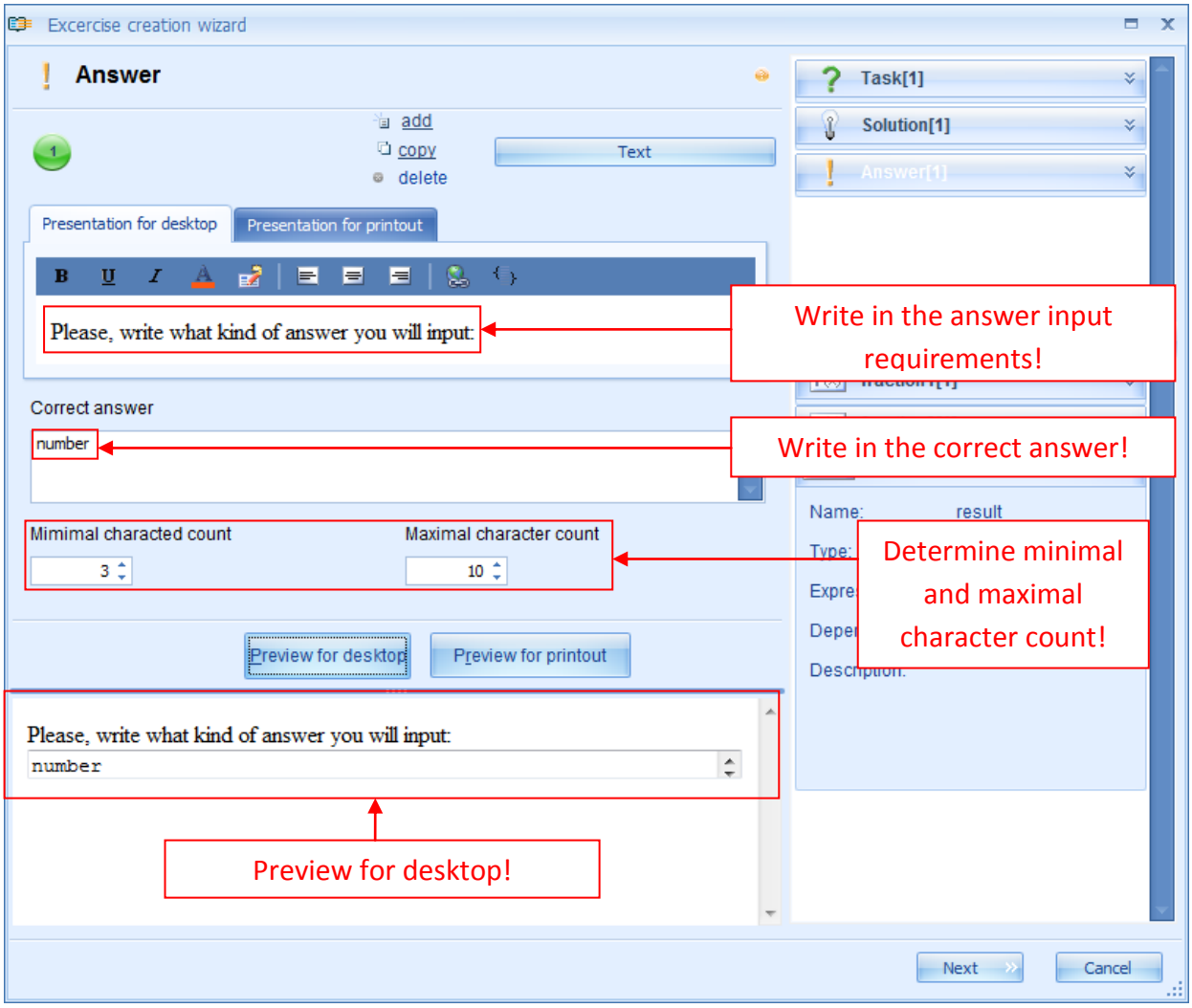


The answer section has two preview modes: **desktop preview and print preview**. Each of these preview modes has its own function: the desktop preview displays what the answer would look like when the student will do this exercise in the virtual environment; print preview displays what the answer would look like in printed document. In order to preview answer in any of those modes click the corresponding preview button [6] and the selected form of answer will be displayed in the preview pane [7].

12.1. Text answer

The simplest way to create a textual answer is to ask the particular question in the exercise text, which requires answer in the form of one or more words. A number of letters or number of words that should compose the correct answer can be written in the answer input requirement section to decrease the possibility that the student could make a mistake during answer input. The system will consider the answer as correct only when it would be inserted in exactly the same way as the answer defined as correct (another case or missed lengthening mark will be automatically considered as other answer, which is not the correct one).

Example:



In case the correct answer will not be entered into the correct answer field, the system will consider any answer as correct. It can be used if the teacher wants to get more detailed, creative answer in a descriptive form or to leave a free space for student`s comments on the solution process, which means that teachers would have to revise it by themselves and evaluate according to contents.

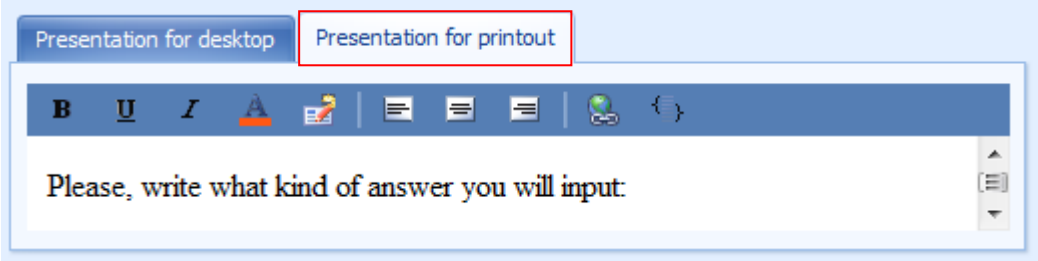
The textual answer can be more widely used in language teaching subjects which verify student`s

knowledge of grammar, orthography or evaluate student`s word stock etc. If a dictation is created in virtual environment then the teacher has to note that inserting of long texts into answer field can lead to mistakes committed through negligence (e.g., double spacing) wherewith the whole answer will be considered as incorrect.

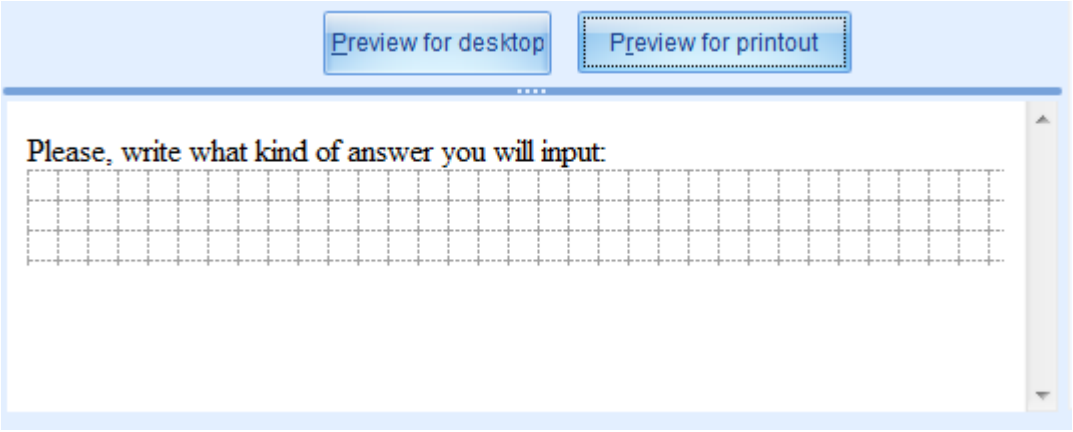
Note: It does not mean that such kind of exercises cannot be created! The teacher simply has to verify all students` answers considered as incorrect.

To define both the answer`s rules and the correct answer, several rules can be used thus ensuring the generation principle. Any of rules necessary to define in the system can be added to answer rule section. The following rules can be added to the answer field: Plain text; Variable name; Number; Calculate formula (only as a result of calculations). If the textual answer requires a number then it is essential to indicate that a number must be used in the answer input.

Preview for printout: printing materials can have other rules for answer input than the exercises in the virtual environment (they can be less detailed because the teachers will check the answers by themselves). The input of answer rules for printout must be done in the section: Presentation for printout.



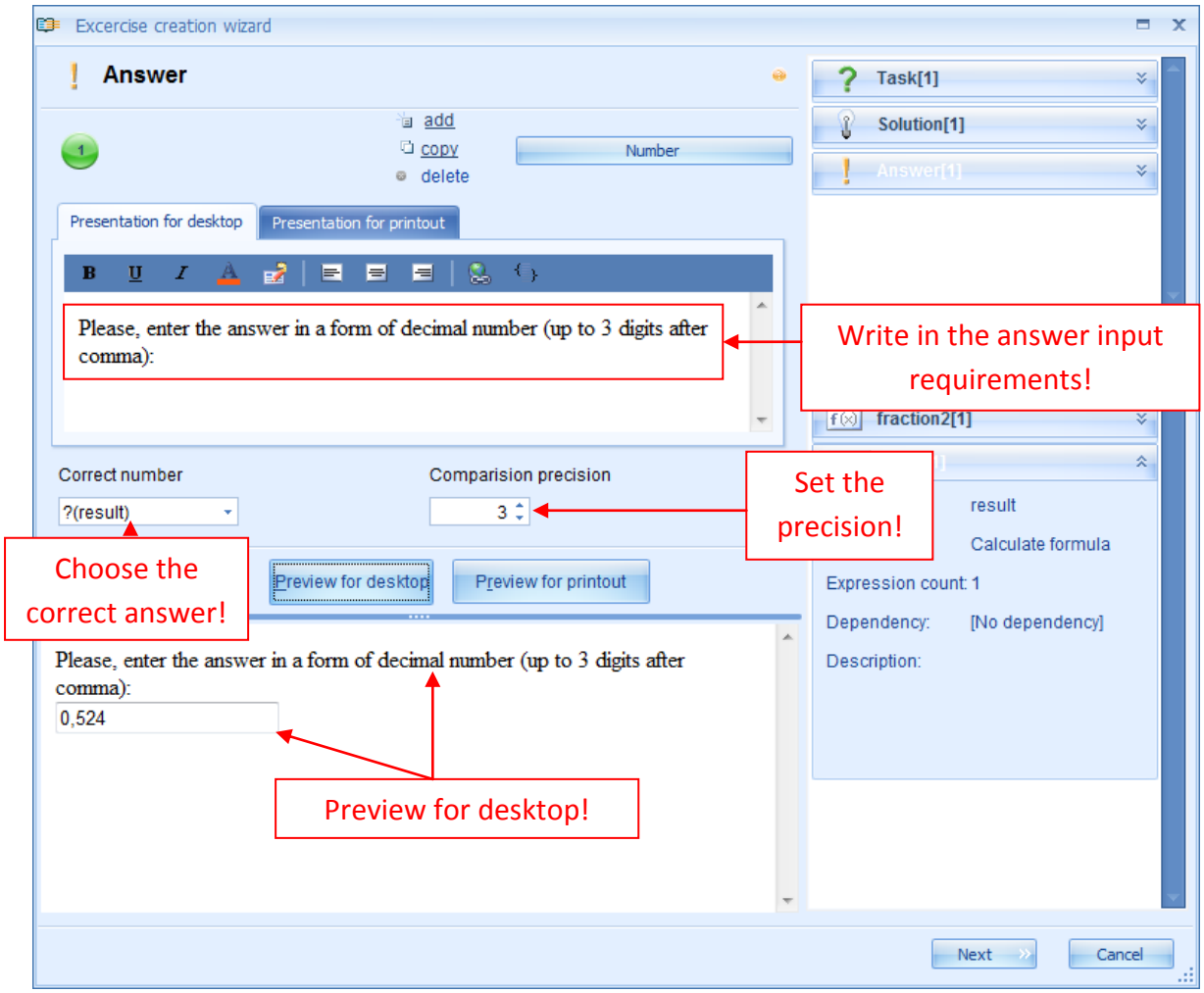
Then click on Preview for printout and view what the answer field will look like in the printout materials.



If the presentation for printout text would not be entered then only a field for answer input without explanations will be put on printout materials.

12.2. Number answer

It is easy to create a number answer. At first the answer input requirements have to be entered (it is essential to indicate what type of number is required – whole, positive or negative, how many digits after comma etc.). It will create preconditions for prevention of unnecessary mistakes (the student would not enter a result with greater accuracy or to the contrary approximate the result, which would be considered as incorrect answers).



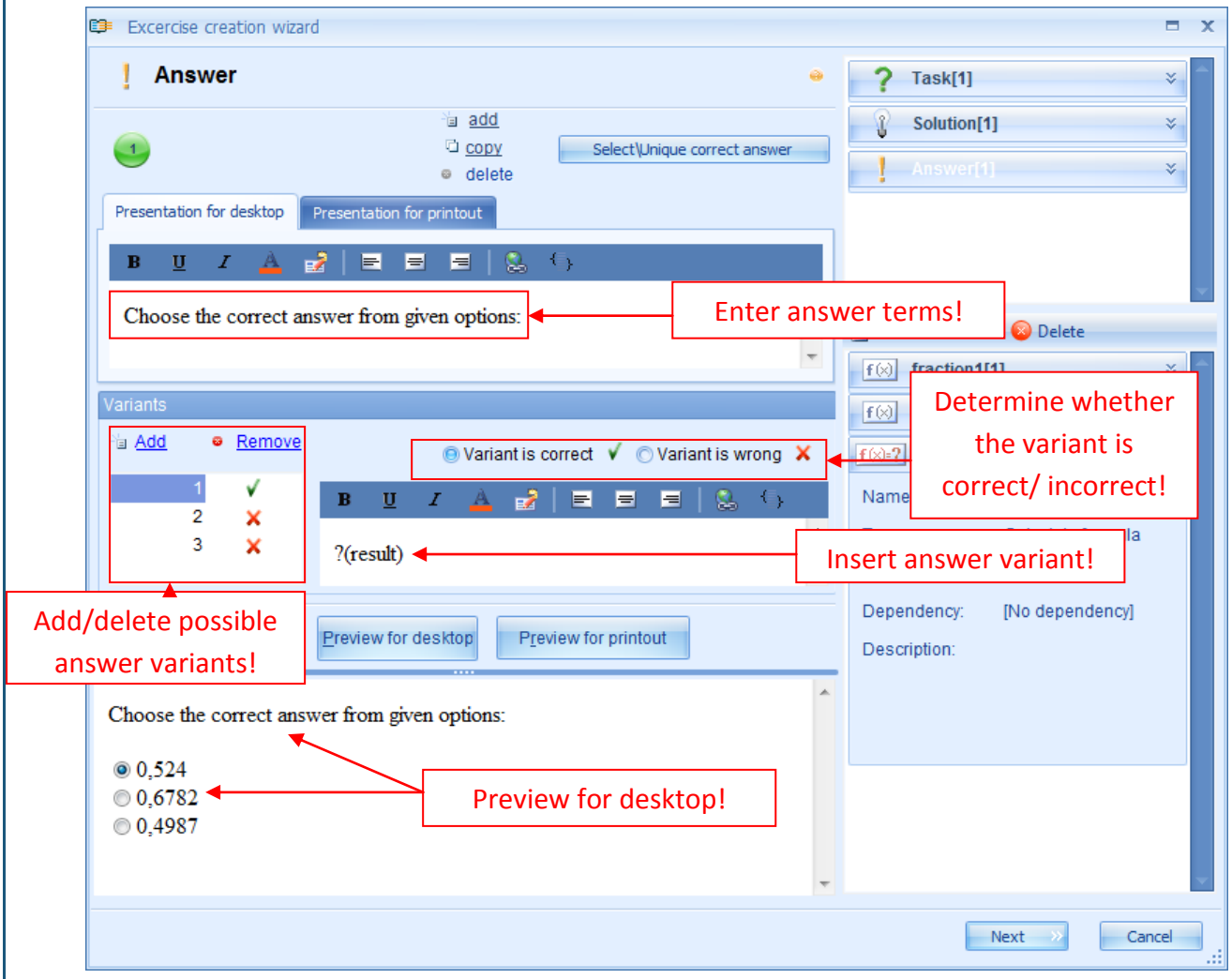
When the answer input requirements have been entered the correct answer has to be selected from the offered menu (it will display all the created number and Calculate formula rules) and the accuracy of answer comparison has to be defined (up to how many digits after comma the student`s inserted answer will be compared with the correct answer).

Any rule can be added to the number answer rules as well as to the textual answer.

In the same way the answer for printout has to be created – according to the answer rules it has to be entered in the Presentation for printout section and by clicking on Preview for printout the user can view how the answer field will look like in the printout materials.

12.3. Select answer: Unique correct answer or Multiple correct answers

Creation of the select answer with a unique correct answer or multiple correct answers is completely identical. The main difference is that when creating a selection with a unique correct answer the user can set up only one of the possible answers as the correct one. In tasks where the answer is made up from several given answer variants the select with multiple correct answers should be used.



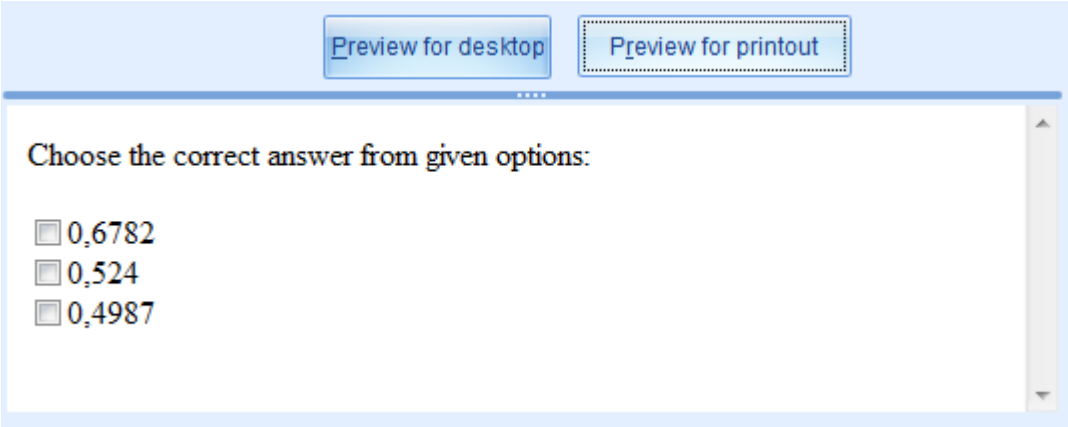
When the menu answer editor is opened the user can access an empty answer rule field (to type in a simple, explanatory text and sequentially indicate the number of correct answers) and one non-defined variant, which is marked as correct (with a green „tick"). **The user can type in the possible answers in the answer input field or use „drag and drop" principle to add any of rules to the answer variant.**

In order to add other answer variant click on Add right next to the answer variant input field. Each of the following possible answers may be marked as incorrect (with a red „cross"). The user can set any other variant as correct if that is needed. Remember that the menu with a unique correct answer can have just one correct answer (wherewith at the moment when any other answer

variant is set as the correct one, others automatically will be set as incorrect) but the menu with several correct answers allows having more than one correct answers (wherewith make sure that all the answers that are set as correct are truly correct).

Note: it is not important, which of the possible answers in a row is the correct one because every time when generating the task, the system will automatically change the succession of given answers.

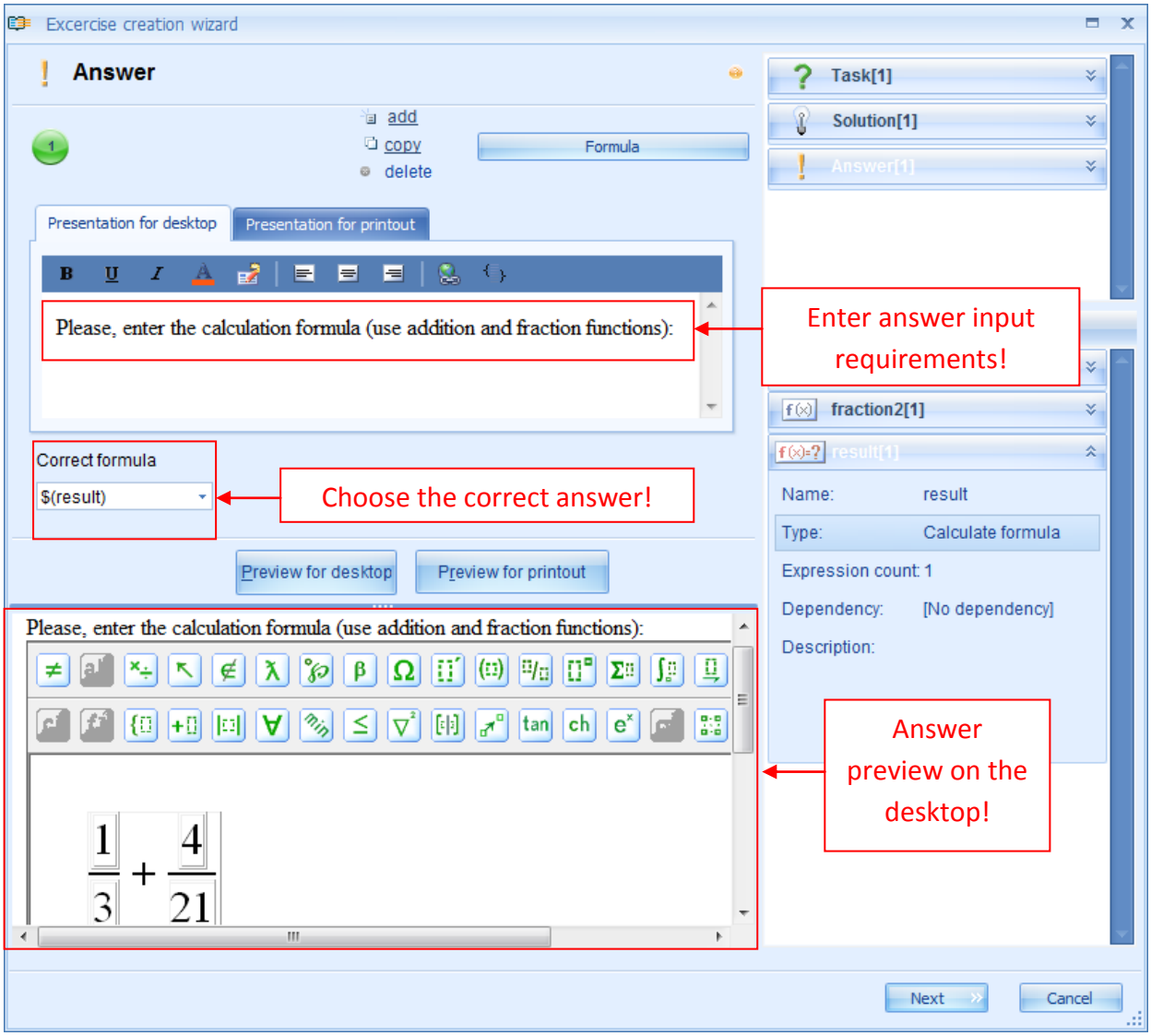
When the user has added and defined all the possible answers they can click on Preview for desktop to view what this answer will look on the desktop. In the same way as for the preceding answer types this type also requires the entering of answer rules for printout in a separate field Presentation for printout. When it is done, click on Preview for printout in order to preview in what way the answer will be displayed in the printout materials.



12.4. Formula answer: General formula or Chemical formula

It is possible to create the formula answer as a general or chemical formula. The general formula is used in cases when the task answer has to be in the form of mathematical formula starting from quite simple expressions (e.g., 300π) to rather complex mathematical formulas. Only the rules of Calculate formula can be defined in the answer of general formula. The chemical formula answer was purposefully generated in case if the answer requires entering of a chemical compound formula. In this case the Formula rule is used to define the answer.

Both types of formula answers are created identically:

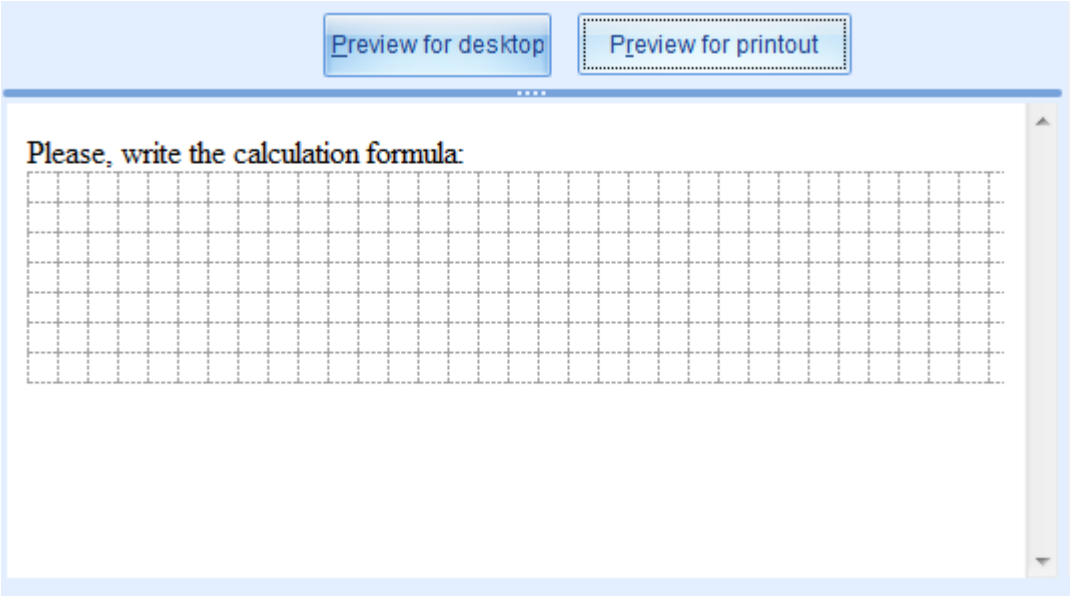


It is essential to indicate in the formula answer input requirements, which of the functions offered in the formulator should be used in order to insert the answer correctly. Otherwise the student may insert the correct answer in a wrong way (e.g., by typing 300π not 300×π) and the system will consider this answer as incorrect. This problem is less significant with the type of chemical formula answer because only indices and brackets are used to enter them.

When the user has entered answer rules and chosen the correct answer from the offered menu,

they can click on Preview for desktop to preview answer on the desktop. The Preview mode of the answer input for desktop is being ensured by the formulator.

Preview for printout requires entering of answer input requirements in the Presentation for printout section or clicking on Preview for printout.



Theme 13: How to form dependencies?

Dependencies within the Genexis system are used to create exercises in which two or more elements have to be interdependent/ interrelated. The elements possible to interrelate are: Task (exercise rules); Solution; all rules: Number; HTML text; Simple text; Variable name; Formula; Calculation formula; Plot 2d; Plot 3d; Resource.

Preconditions for the creation of correct dependency in the GenExis exercise are as follows:

- The elements among which the dependency is being created must contain equal number of expressions;
- Correct sequence of expressions: when creating a dependency among two exercise elements its expressions will be interrelated and this correlation will be determined by the ordinal number (expression No1. in one element will depend upon the expression No.1 in the other element etc.)
- Do not create cyclic dependencies: if the user sets that one element will depend upon other element, for example, the formula rules will depend upon the number rule then it is not necessary to set the dependency in the opposite direction, for example, number rule dependency from formula rule. Thereby the cyclic dependency, which loses its sense, is set.

The creation of dependencies in the exercise is best explained through example: let`s create an exercise, which requires formation of dependency among task (task rules) and resource rule and among task (task rules) and the number rule. Let`s assume that we want to create a simple problem solving exercise to practice counting numbers. Besides we would like supplement the task rules with a picture suitable to rules of our exercise. Initially we thought of task rules: since we want the student to count ones and tens as well as several tens of thousands we need to think of enough situations. Let`s assume that we want to create an exercise with two different situations: apples (need to count small numbers) and an anthill (need to count five digit numbers). Let`s describe both imagined situations in the question section: each of them as a separate expression. Since the exercise conditions must contain variable numbers then let`s create two number rules: first in which we define the initial number of apples/ants (the number of apples has to be comparatively small, while the number of ants in the anthill usually reaches tens of thousands) and the second in which we define how much and on what rules the number of apples/ants will increase.

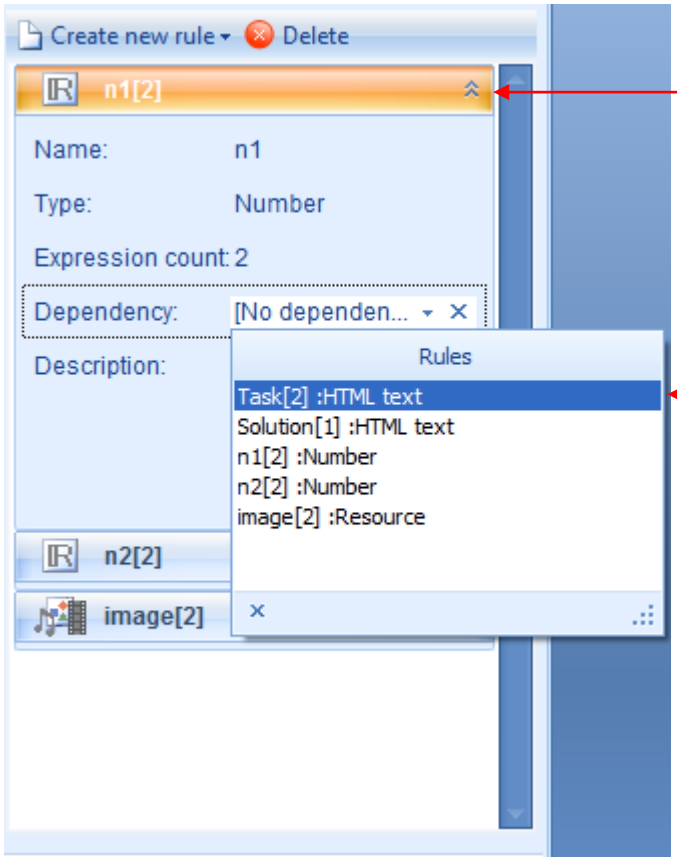
Note: don`t forget that there can be only 2 expressions in each number rules to form a correct dependency thus ensuring the generation process, it is valuable to use whether the interval of the number rule or value list within the limits of the corresponding expression.

Sequentially a new resource rule can be created and two pictures added: apple and anthill.

Note: while creating all the dependency elements it important not to forget to maintain the correct sequence of expressions (for example, all rules that refer to apples in all elements are like the first expression and all the conditions referring to ants are as the second expression).

When all the variable values (rules) have been created they can be put into the exercise rules. Before setting up dependency the user should view in the preview mode whether numbers and pictures generate incongruously with the question text.

Let`s set up the dependency among the question (task rules and number rules):

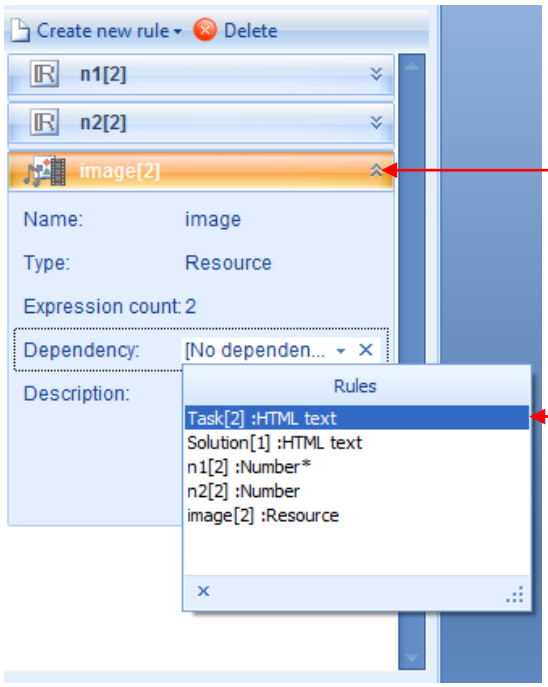


Click here to expand information of the selected rule!

Click into field where it is initially written [No dependency], and select the correct element from the offered options! In order to create dependencies with a question select Task [2] :HTML text.

In the same way set up also the dependency among the task (task conditions) and the other number rule: in this case the dependency can also be set up from the first number rule, which is already dependent upon the task rules.

Likewise set up the dependency among the task (task rules) and resource rule.



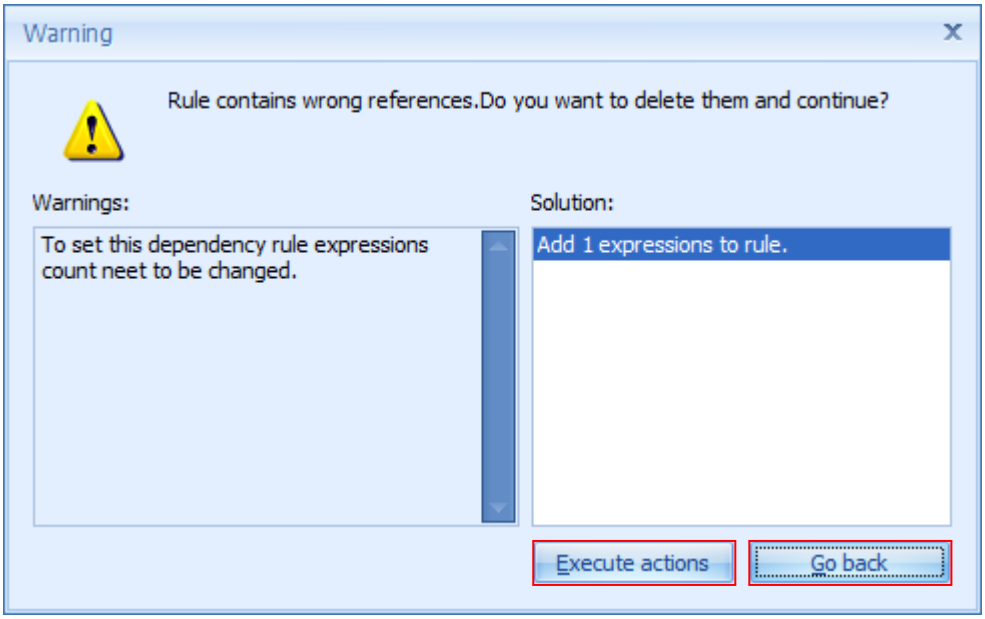
Click here to expand information about the rule!

Click into the field where it is initially written [No dependency] and select the correct element from the offered options!

In this case the dependency to the resource rule can be created from the task (in the same way as for the number rule) or from any other element, which is already dependent upon the task. All the elements, which have the dependency already set, are marked with * next to its name (for example, n1[2]:Number*).

When all the dependencies have been set, the question preview shows that variables in the exercise do generate according to the textual part of the exercise.

The above described way shows how to successively create dependencies when all of the elements forming dependencies have a particular number of expressions. The dependency among two rules can be created in the case when the user has created only one finished element of planned dependency but the others contain incomplete or no information. Let`s assume that we have created a task (exercise rule) with two expressions as well as the first number rule, which does not yet contain anything (except for one automatically generated empty expression). And we immediately set the dependency from the task to this rule. A warning appears saying that in order to create this dependency the count of rule expressions has to be changed:

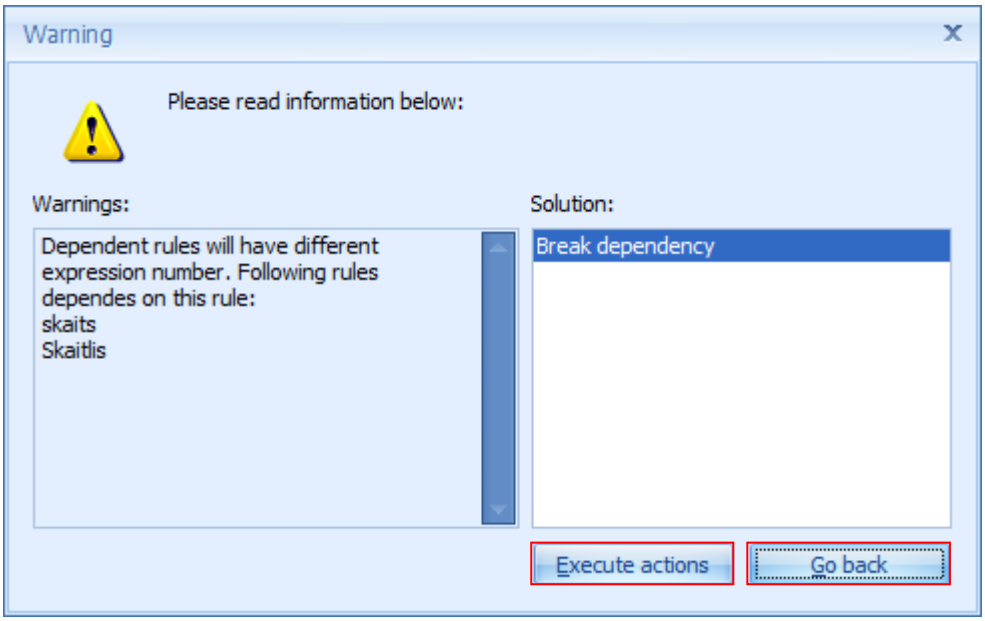


The warning offers an instant solution: add one (the necessary amount) expression to the rule. If the user wants to perform this action, click „Execute actions” and the system will automatically add a new, empty expression or several empty expressions to the corresponding rule. If the user wants to cancel the creation of dependency, click „Go back”.

If the user chooses to add the missing expressions in order to create the dependency, then it is important not to forget to define these empty expressions later on, not to allow a situation that the exercise is saved as incorrect. It can be done by editing the particular rule.

If the user would like to increase the number of expressions to any of the dependency elements when the dependency has been already set then that could not be accomplished without breaking the dependency. The possibility to add new expressions to all of the dependency elements, which have been set as dependent from something, is automatically deactivated (mode „add” is not active).

If the user will try to add a new expression with dependency elements, from which the initial dependency was formed then the system will show a warning informing that elements depending from this has other number of expressions:



In this case the solution offered by the system is to break the created dependency. If it is performed then remember to reset these dependencies afterwards. To confirm the offered solution click on „Execute actions". In order to cancel all previous actions, click on „Go back".

Note: several different dependencies not resulting from an initial element can be formed within the limits of one exercise. Everything depends on the level of complexity and the ingenuity of task creator. For example, in the case of our example it would be necessary to create dependencies for the solution and the answer as well or create this exercise by using dependencies among completely different elements – leaving one expression in the question and creating the textual part as a simple text or HTML text from which sequentially dependencies will be formed etc.

In the same way as with the rules, the dependency could be formed with task as well (exercise rules) or solution – by simply expanding the information section of the particular exercise and choosing some other element to form the dependency from in the Dependency section.

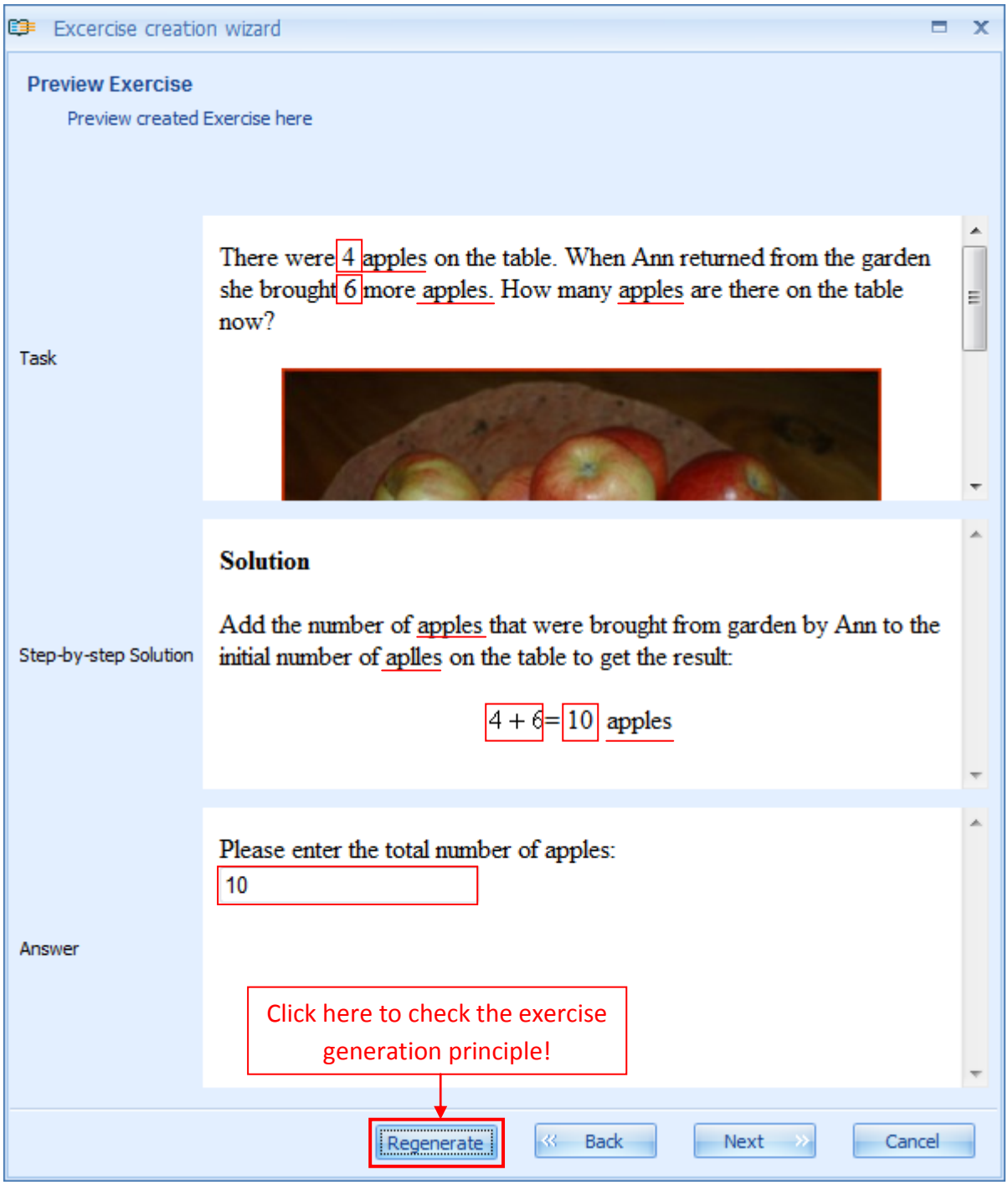
The answer is the only element which does not allow forming of dependency and from which a dependency cannot be formed. The system would not allow the user to expand the information about the answer and the warning will appear saying that the rule cannot be edited or deleted.

The reason for it is functionality when each answer expression serves as one of the answers in the exercise thus ensuring the possibility to ask several questions to the student within the limits of a single exercise. Dependencies in the answer can be formed through rules, namely, in most cases the correct answer is one of these rules and it can be dependent upon other exercise elements.

Theme 14: How to finish the exercise creation?

When the user has successfully inserted the exercise: task, solution and answer and remains satisfied with the obtained result after the preview of each part separately, there are only a few steps remaining to finish the exercise creation.

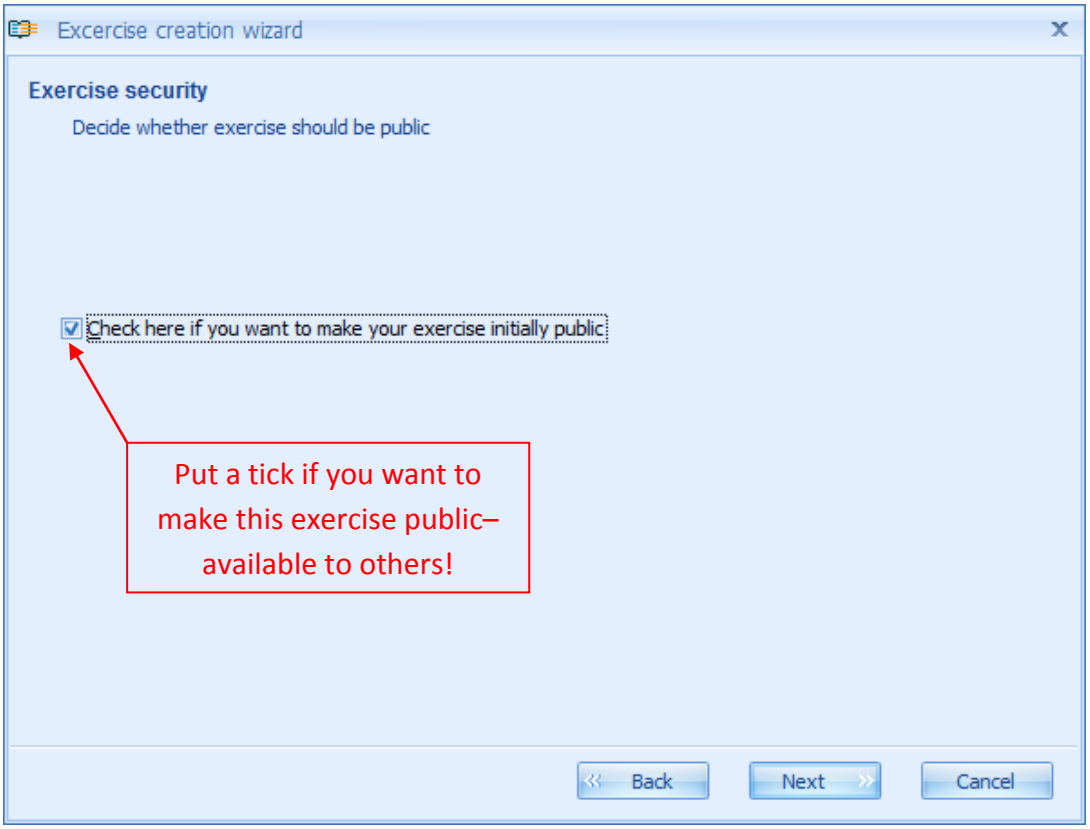
Click „Next" to quit the exercise creation wizard and move on to the preview window of all the exercise:



It is possible to review the created exercise for correctness as well as for the generation principle in

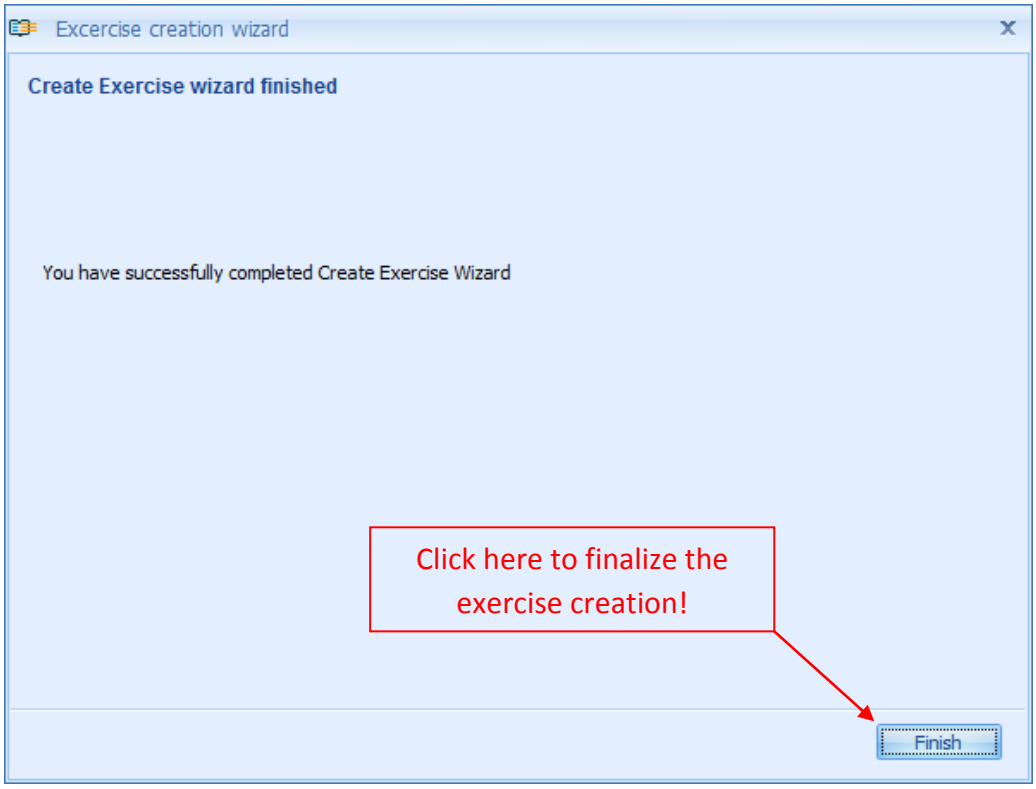
the Exercise preview mode. By repeatedly clicking on „Regenerate", all the variables in the exercise will be regenerated thus allowing checking whether the dependencies have been set correctly throughout the exercise and whether the mathematical actions and answers correspond to the exercise rules and solution process. If any mistake is found the user can return to the exercise content editing mode by clicking „Back".

But if the user is satisfied with the created exercise (its correctness, layout etc.), then click on „Next" to move on the next step:



In this exercise creation step choose whether to make the exercise initially public – available also to other users in your particular educational organization. If the exercise is not fully finished and the user just wants to save it for editing later then it is not advisable to create this exercise as public. Generally, whether the exercise is being set as public or not is dependent on the opinion of the exercise creator. The exercise status can be changed anytime through the exercise settings because this window would not be displayed in the exercise editing mode again.

When the user has chosen whether to create the newly created exercise as public or not, click „Next” to move on to the next step:

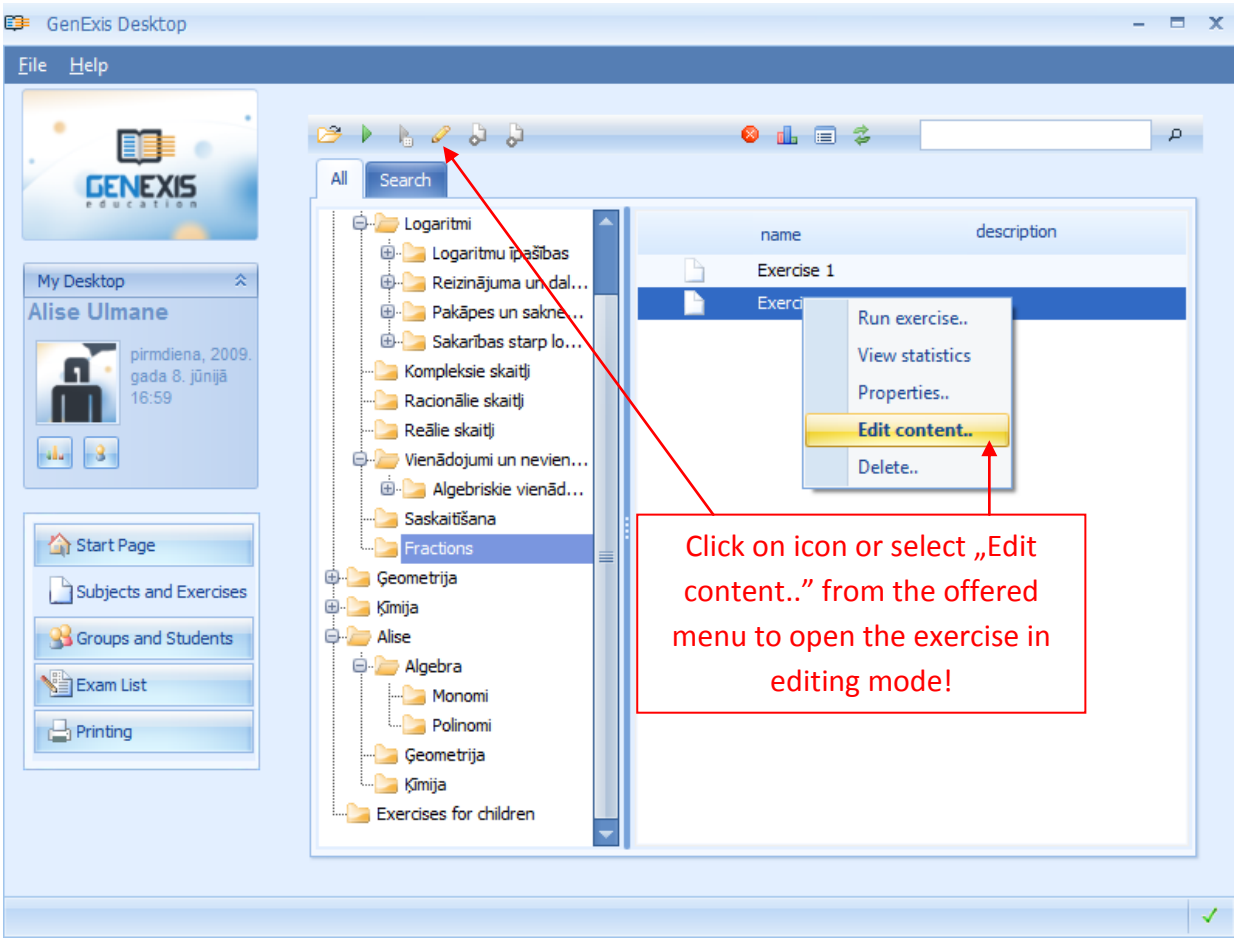


In this step the system notifies that the user has successfully created the exercise and completed the exercise creation wizard! Click on „Finish” to quit the wizard.

Congratulations, you have successfully created a new exercise!

Theme 15: How to edit an exercise?

After the creation of any exercise it is possible to edit its content or settings. To edit **the content of an exercise** user has to open the exercise creation wizard in the editing mode:



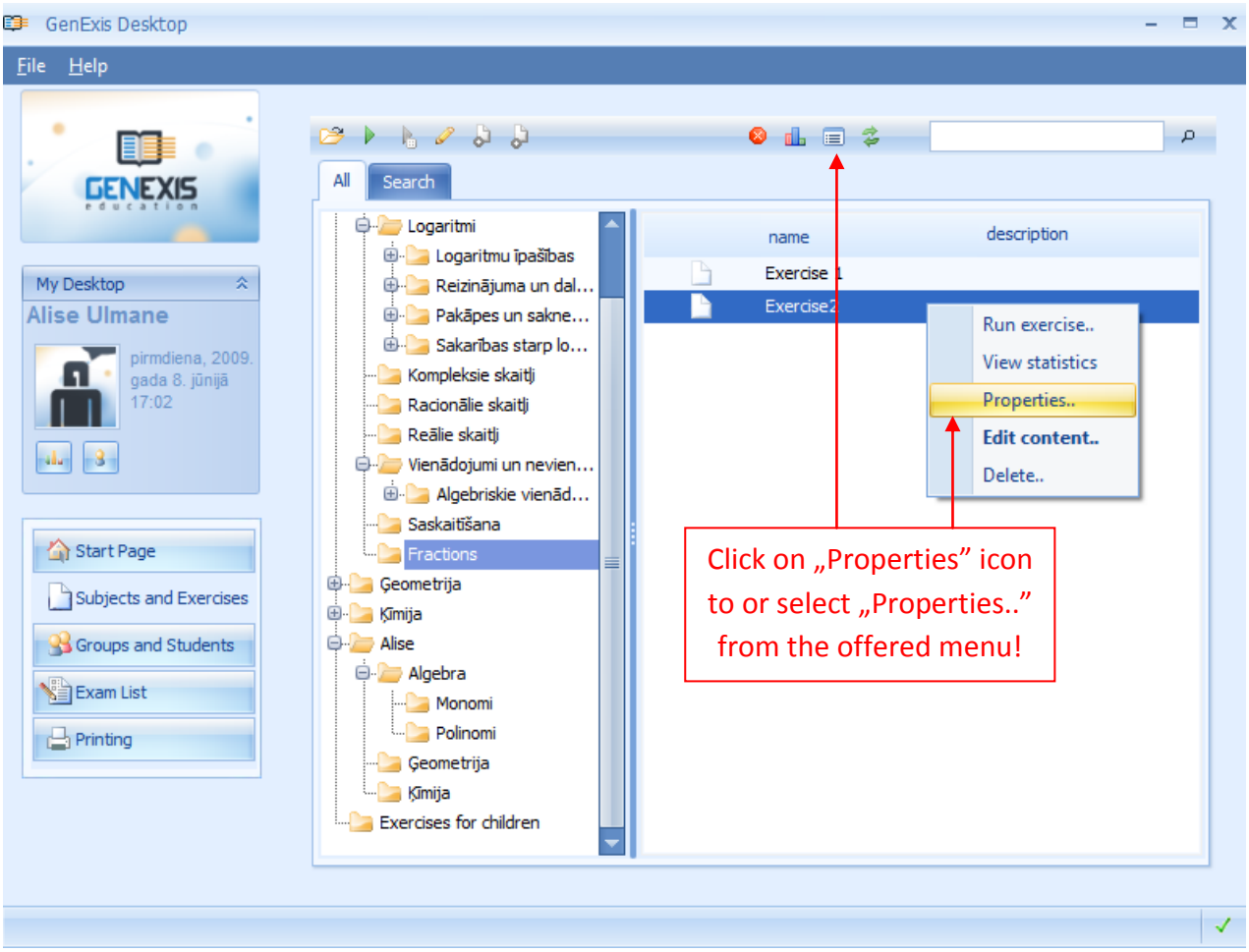
If the user has ECW license assigned then he/she can open the exercise in the editing mode in three different ways:

1. By choosing the corresponding exercise and by double-clicking opening it in the content editing mode;
2. By choosing and selecting the corresponding exercise and clicking on pencil icon in the toolbar;
3. After choosing and selecting the corresponding exercise click the right mouse button and choose „Edit content” from the offered menu.

When the user has activated the Edit content function in one of the described ways, the system will automatically open the exercise creation wizard starting with the exercise content input step. In this mode the user will be able to perform all the necessary corrections likewise as creating the exercise.

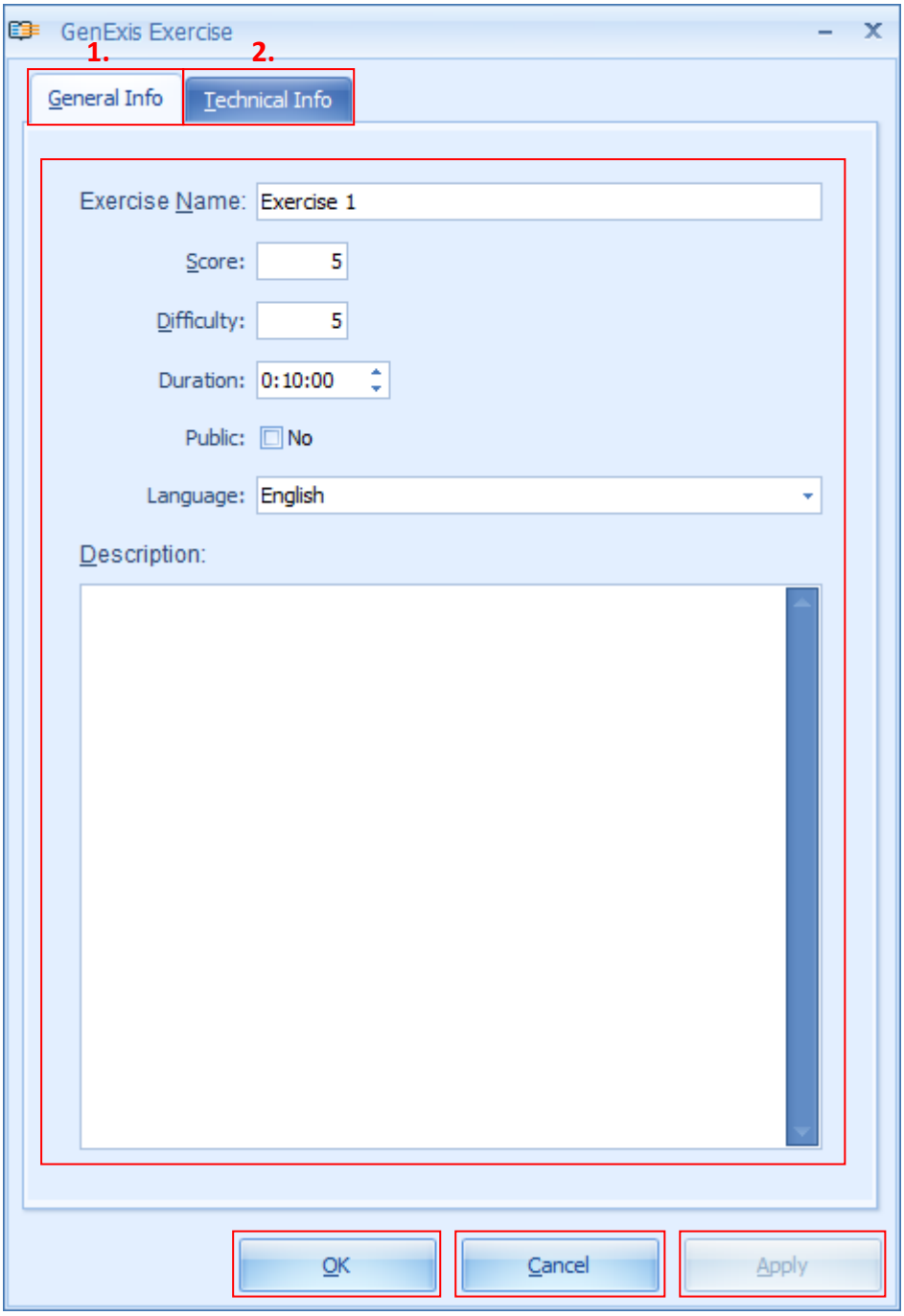
In order to save the changes made the user has to finish the exercise creation (editing) in the same way as when finishing the exercise creation.

The exercise settings can be edited through the exercise`s Properties section. Two methods can be used to open it: the corresponding icon from the offered toolbar or the right mouse button, which will open the options menu.



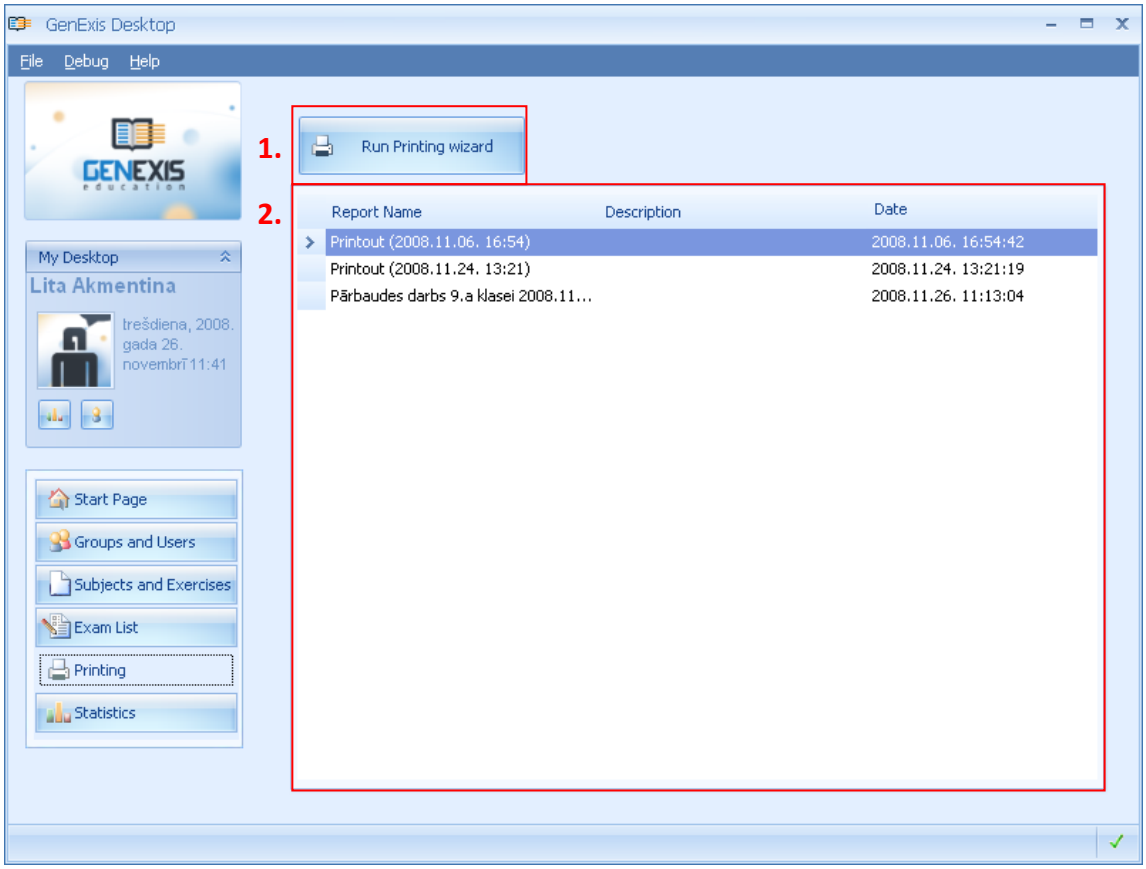
When the opening of exercise settings has been performed in one or the other way the Properties window of exercise containing general [1] and technical information [2] will be displayed to the user. The general information section allows editing all the initial exercise settings: change the name of the exercise, obtainable score, level of difficulty, language and description, as well as change the public status of the exercise (availability within the frames of the particular education institution). The technical information contains the name of exercise creator and information about the creation date and the name of the user who was last edited it and the time when was it done. The technical information cannot be changed.

If any corrections will be made to the general information section the system will activate the button „Apply" by clicking on which all the changes made will be saved. In order to close this window and simultaneously save the user can click on „OK". If the user has made any changed in the general information but does not want to save them they must click on „Cancel".

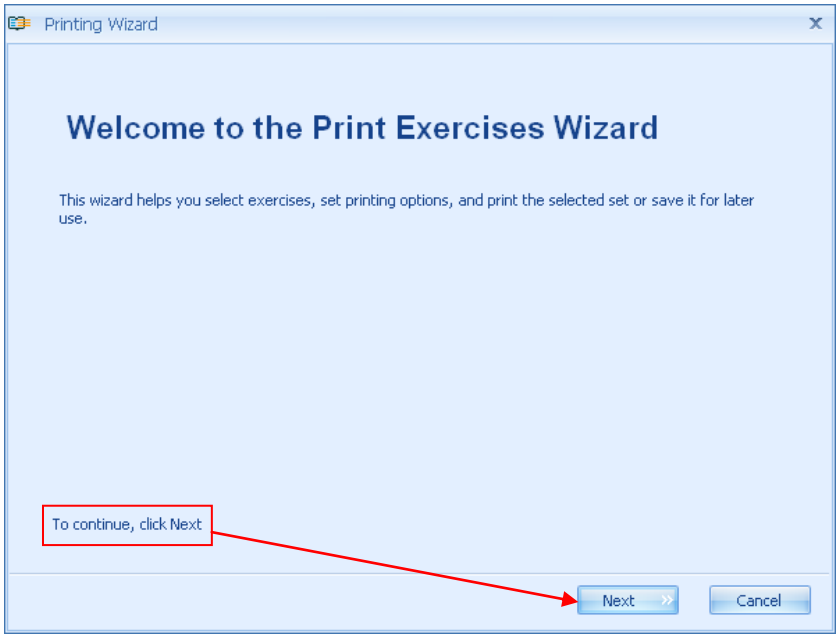


Theme 16: How to print exercises/tests?

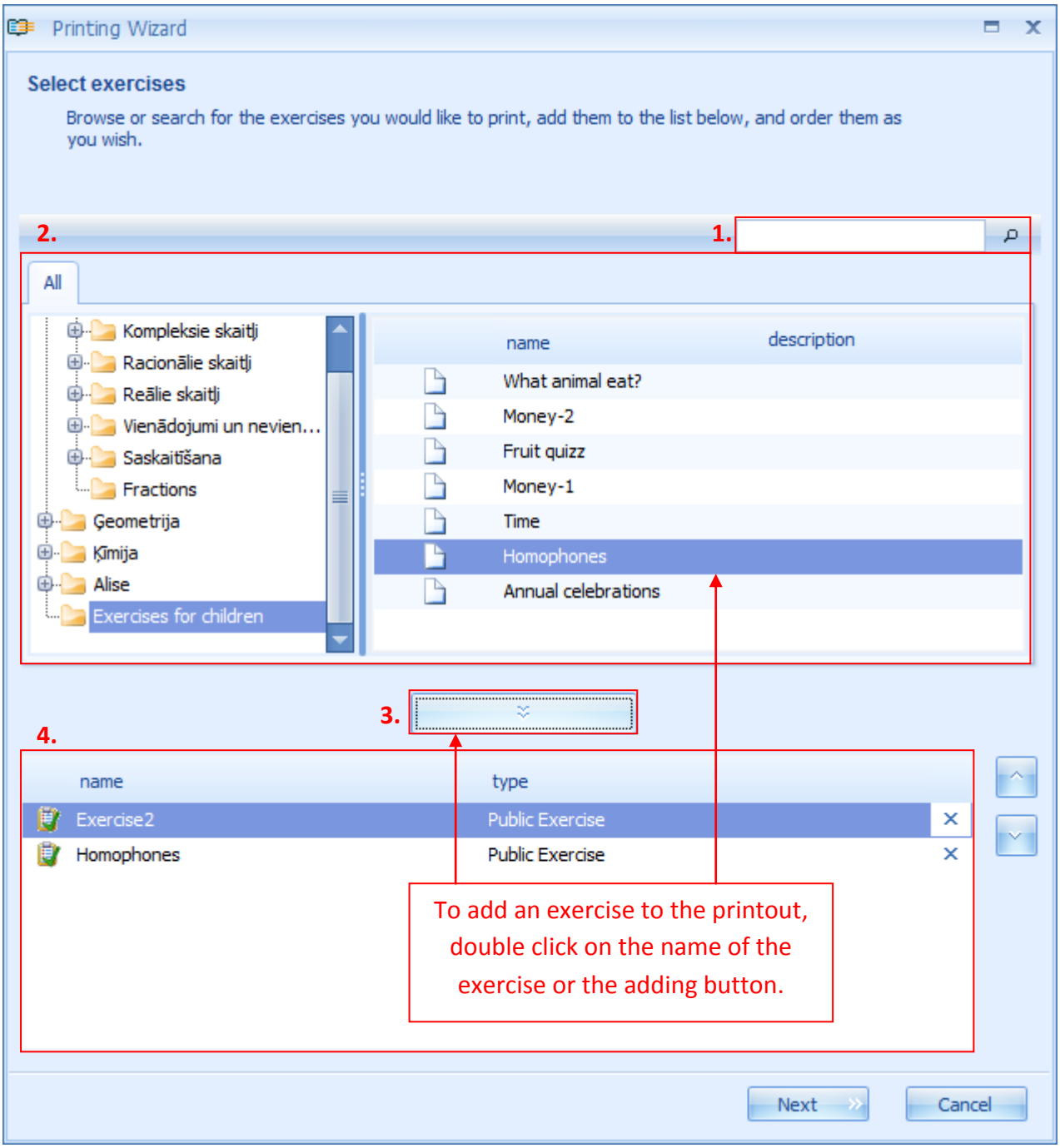
In order to create new printouts (homework/exercises/tests, etc.) the user must open the section "Printing" (see Theme 2). In this section the user sees a list of already created and saved printouts (if such exists) [2] and the button for running printing wizard [1].



To start creation of new printouts, press "Run Printing Wizard" [1]. The system will immediately open the exercise printing wizard. To begin working, click "Next". If the user wishes to exit the wizard without saving the accomplished work, click "Cancel" (this can be done at any preparatory stage).

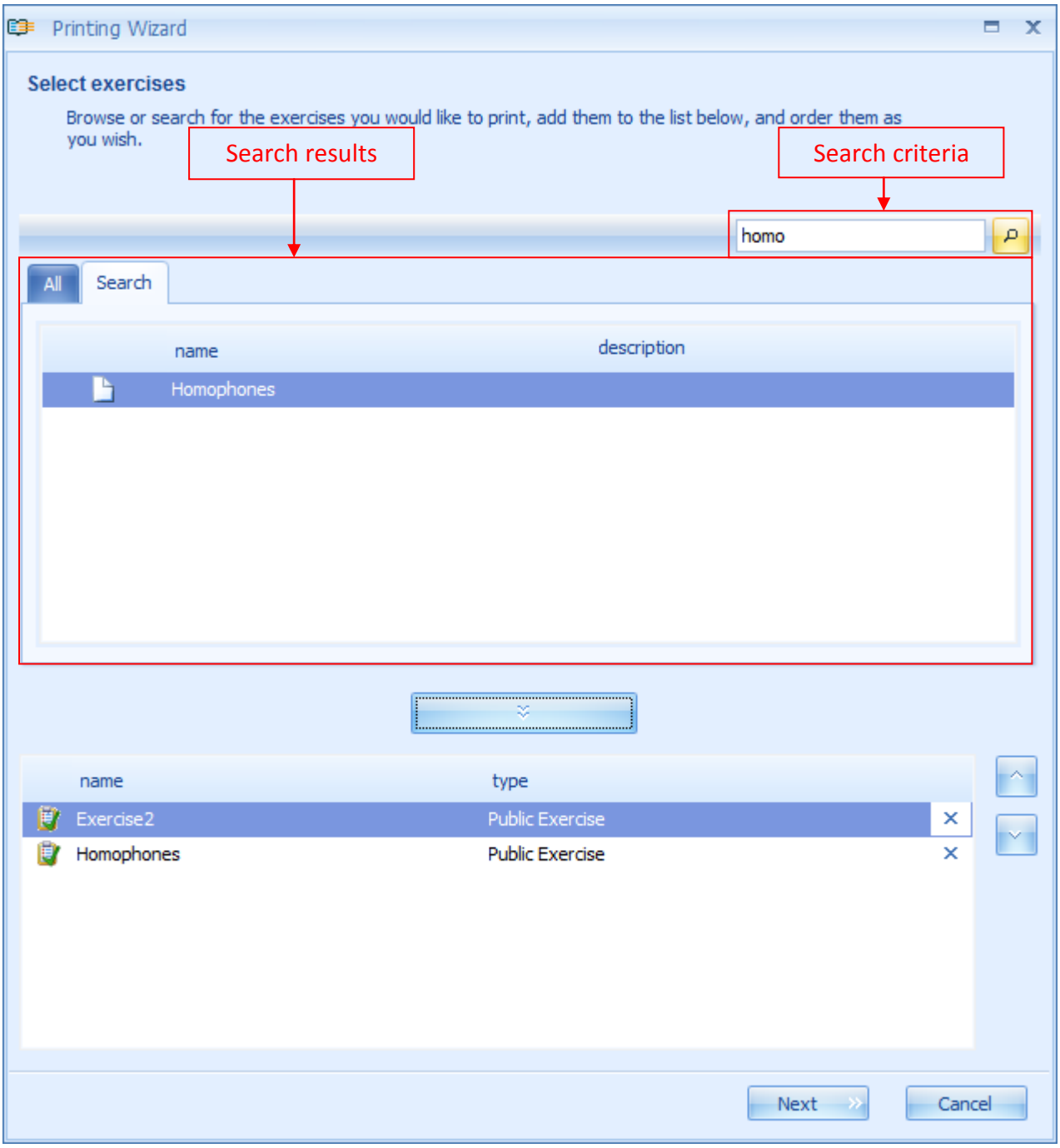


The next step is to **select exercises** which need to be included in the printouts. This can be done in two ways: by using the theme and exercise browser [2] or by performing a search [1].



When using the theme and exercise browser, you must first search the themes and sub themes [2] to find the folder(s) with exercises which you wish to include in the printout, open them so that the list of exercises is displayed in the left window. You can move the selected exercise to the bottom window [4] by double clicking it. The alternative for including an exercise in the printout is to select the chosen exercise and then click the adding button [3]. Another option for adding exercises is to choose a folder with exercises from which the system will automatically and randomly choose one of the exercises from the selected folder. In order to do that you must select the chosen folder and click on the adding button [3].

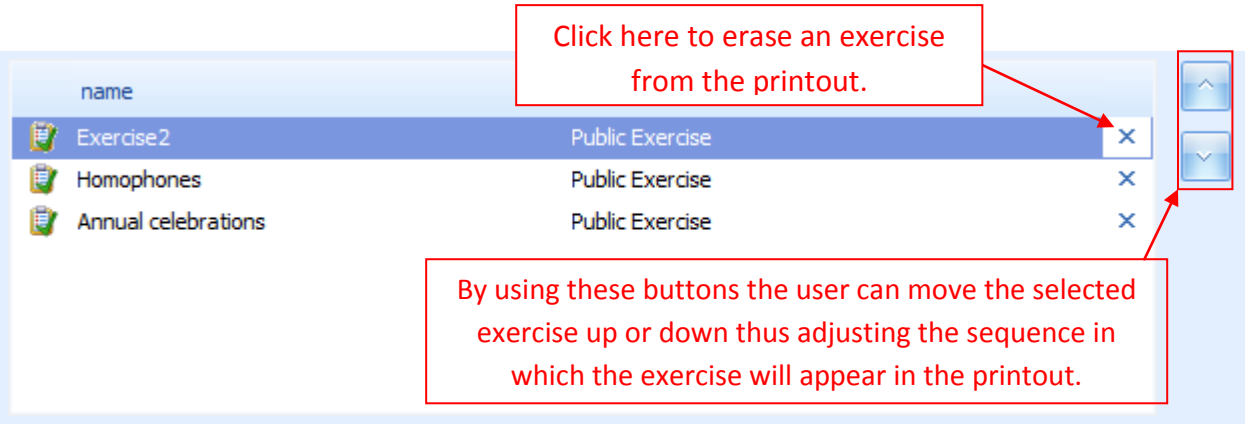
If the tree of themes and sub themes is complicatedly structured, the user can use the search to quickly find the necessary exercise. Write the keyword(s) or syllables in the search window [1] and click on the magnifier icon. All objects in the theme and sub themes tree complying with the inserted criteria will be selected and shown in a new window.



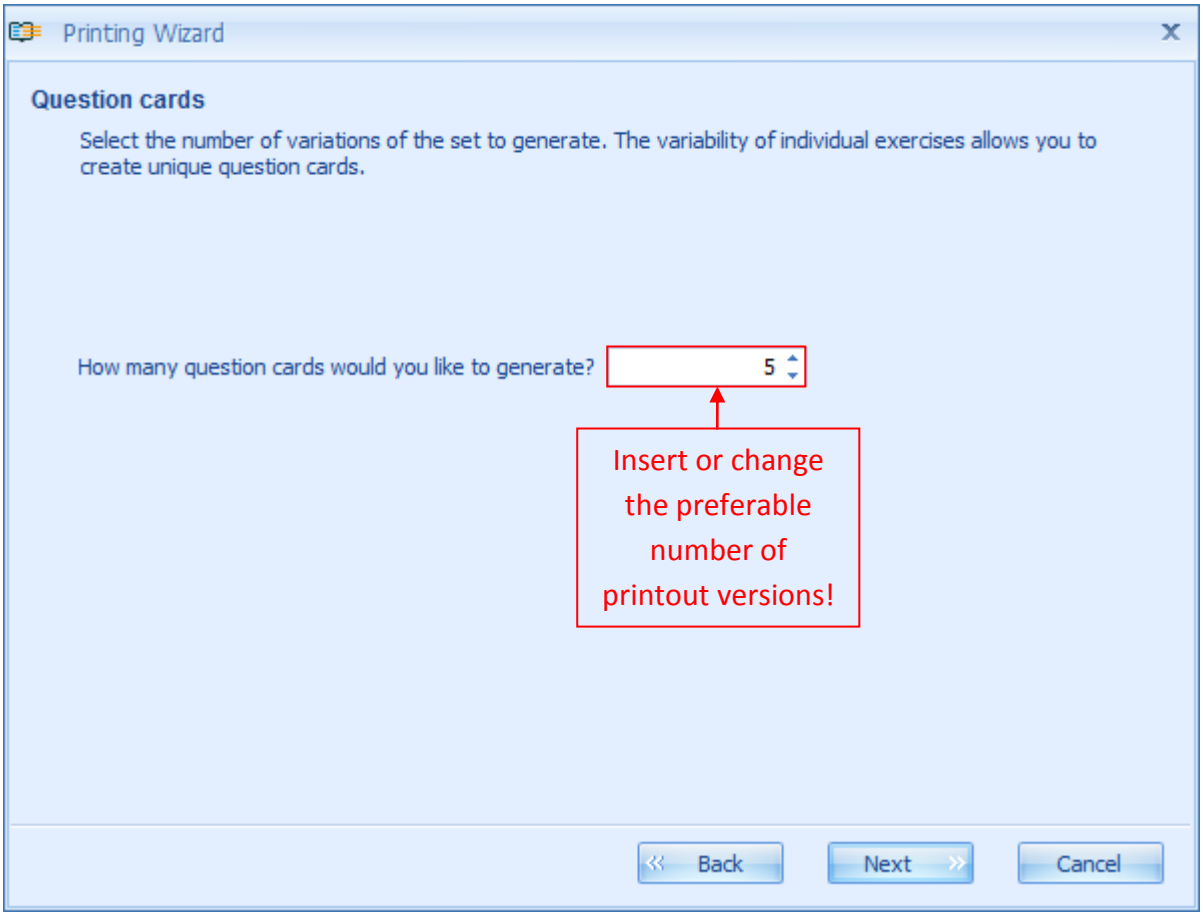
It is possible to select and add the necessary exercises for the printouts from the search results in the same way as from the theme and exercise browser window.

Note: from this view it is not possible to open folders and to see its contents but by using the adding button it is possible to include randomly selected exercises from the chosen theme.

When all the necessary exercises for the printout have been selected and added, it is possible to change the sequence of the exercises in which they will be shown on printout as well as to erase the unnecessary exercises.

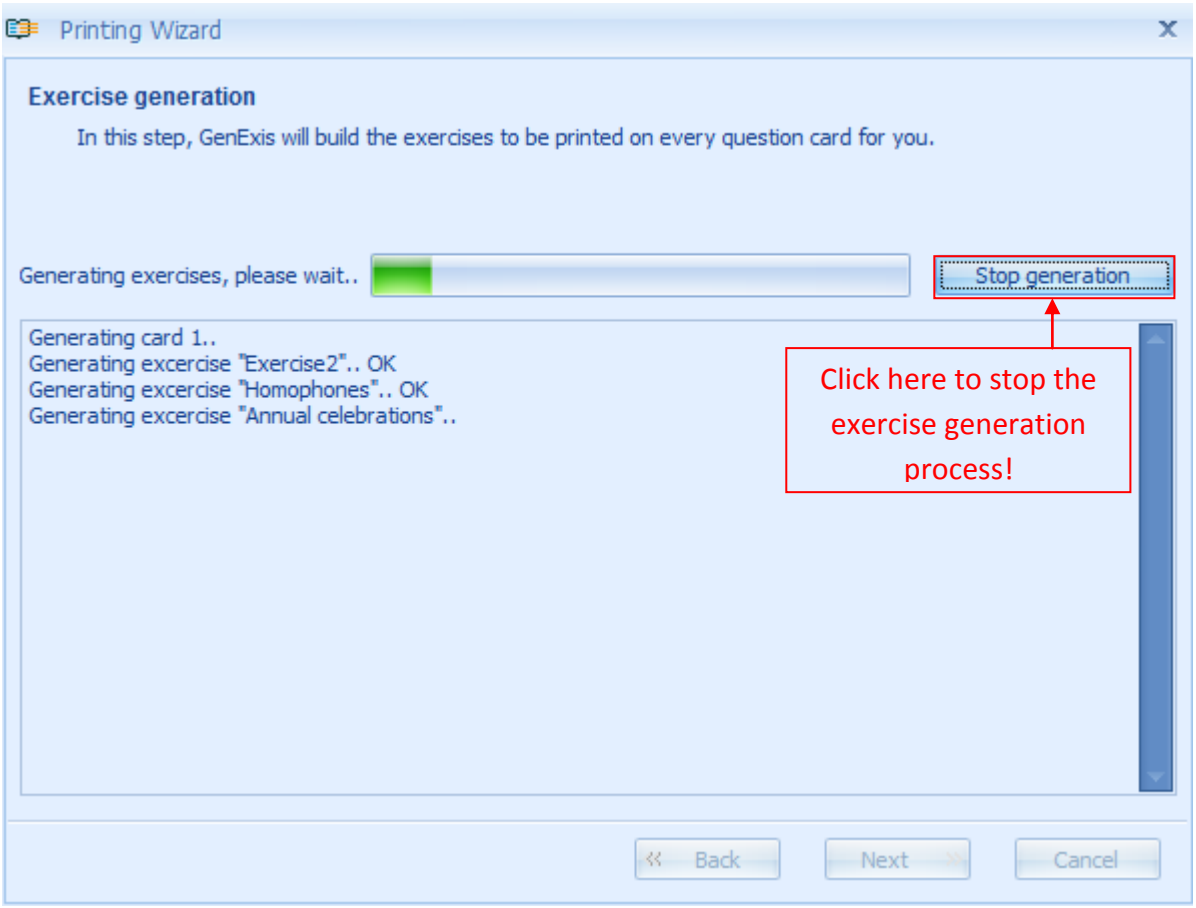


When the user is satisfied with the content of the printout (exercises and their sequence), press "Next" to go to the next window.



In this window the user can insert the number of printout versions – how many different versions the system must generate (maximum is 50).

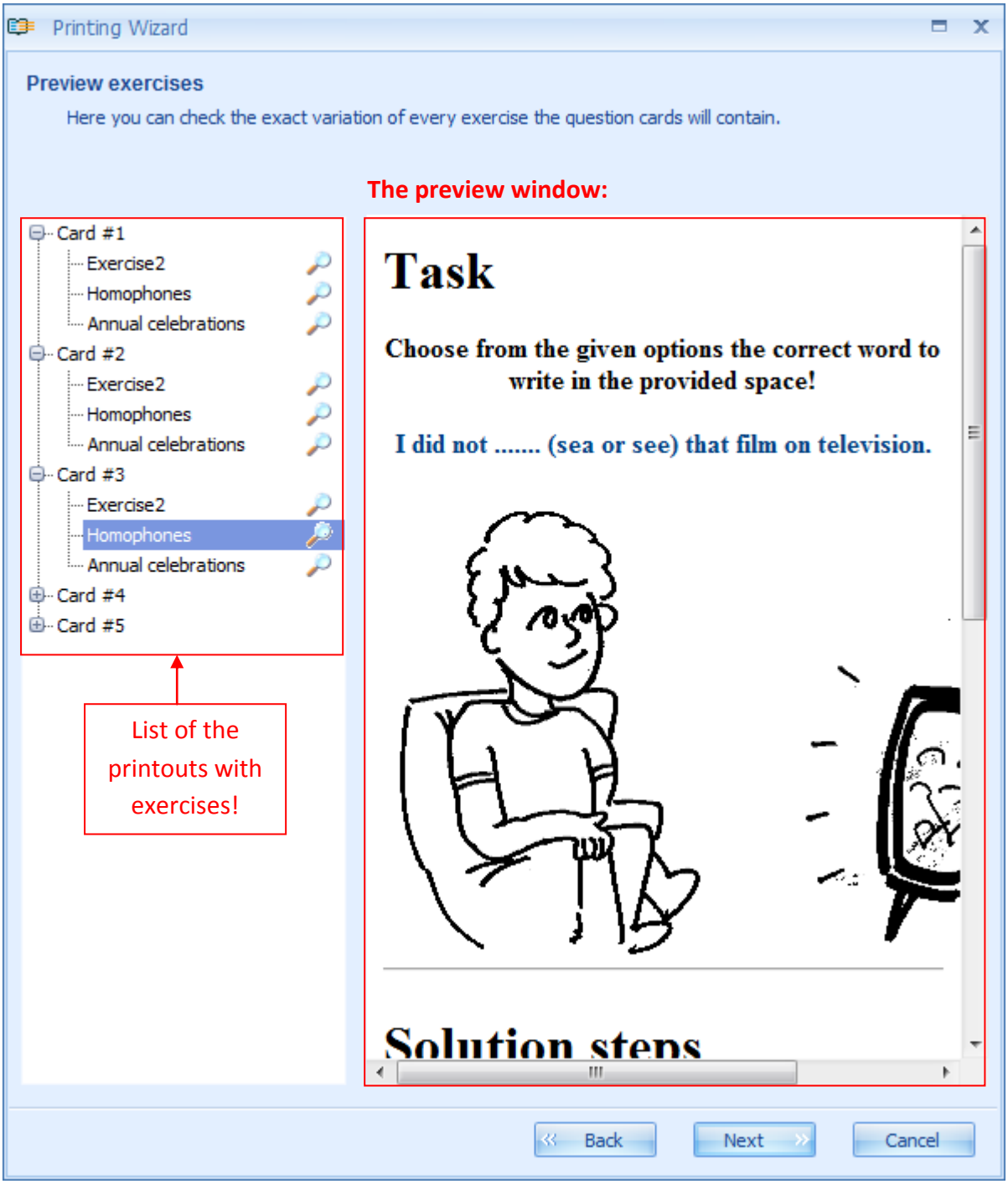
When this is done, the user must click on “Next” to go to the next window.



In this window the system shows the printout generating process. If necessary it is possible to stop it by clicking on “Stop generation”. After that the user can return to the previous windows and change or edit the input information or continue to work with the printout materials that were completely generated (if for some printout variations the system has generated the exercises only partly, it will not be possible to print them).

When all of the printout variations are successfully generated click “Next” to continue working.

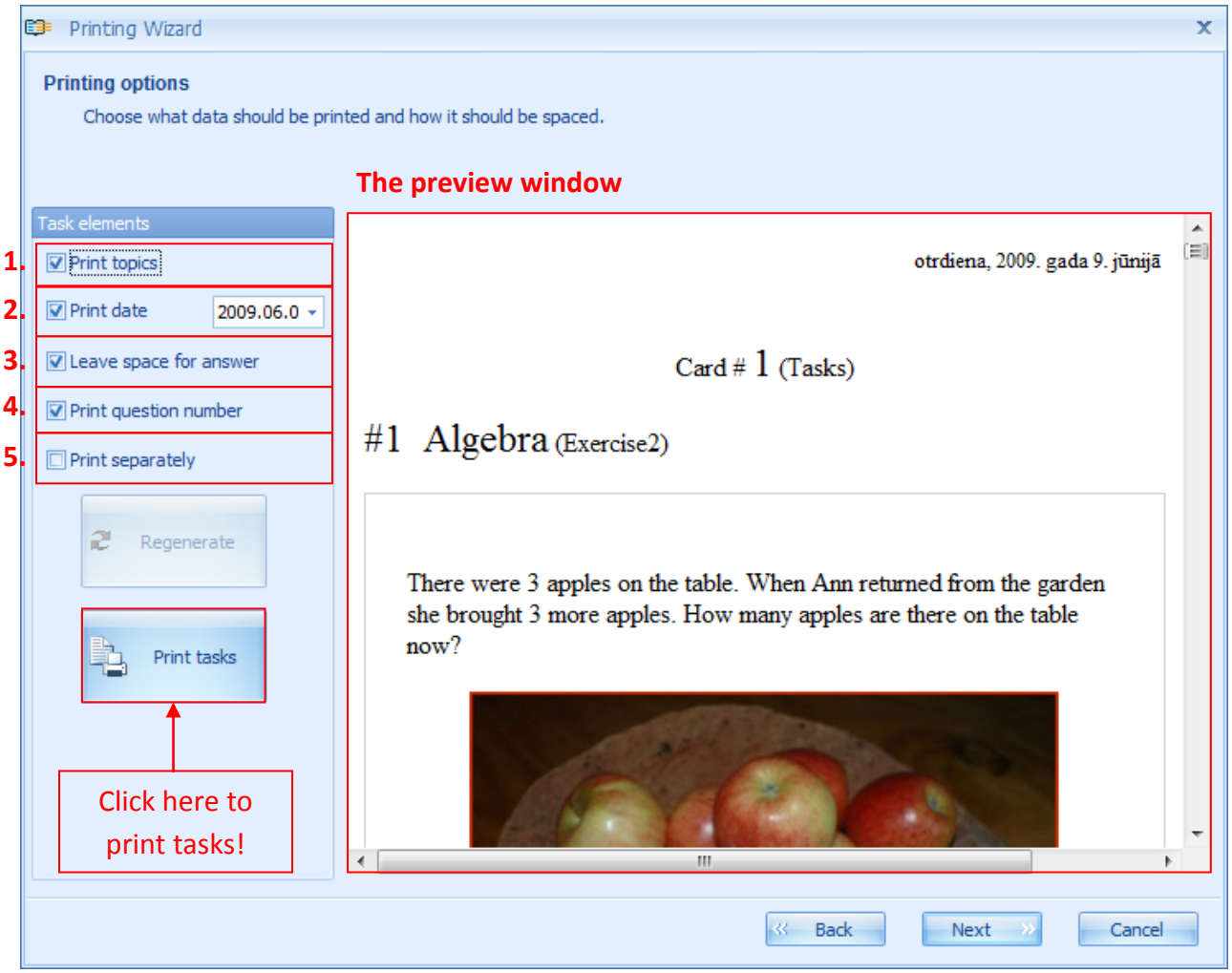
The user is able to preview the generated exercises for the printouts in the next window.



By extending the list of the printouts (clicking "+" by each printout name) the system allows to preview each version of exercises (thus the user can make sure that each printout has different exercise versions). This stage of the printout preparation is useful for ensuring that the content of the printouts complies with the desired results. If changes are necessary the user can always return to the previous steps (selecting exercises or inserting the number of versions). When the user has verified the correctness of the printout content, click "Next" to go to the next window.

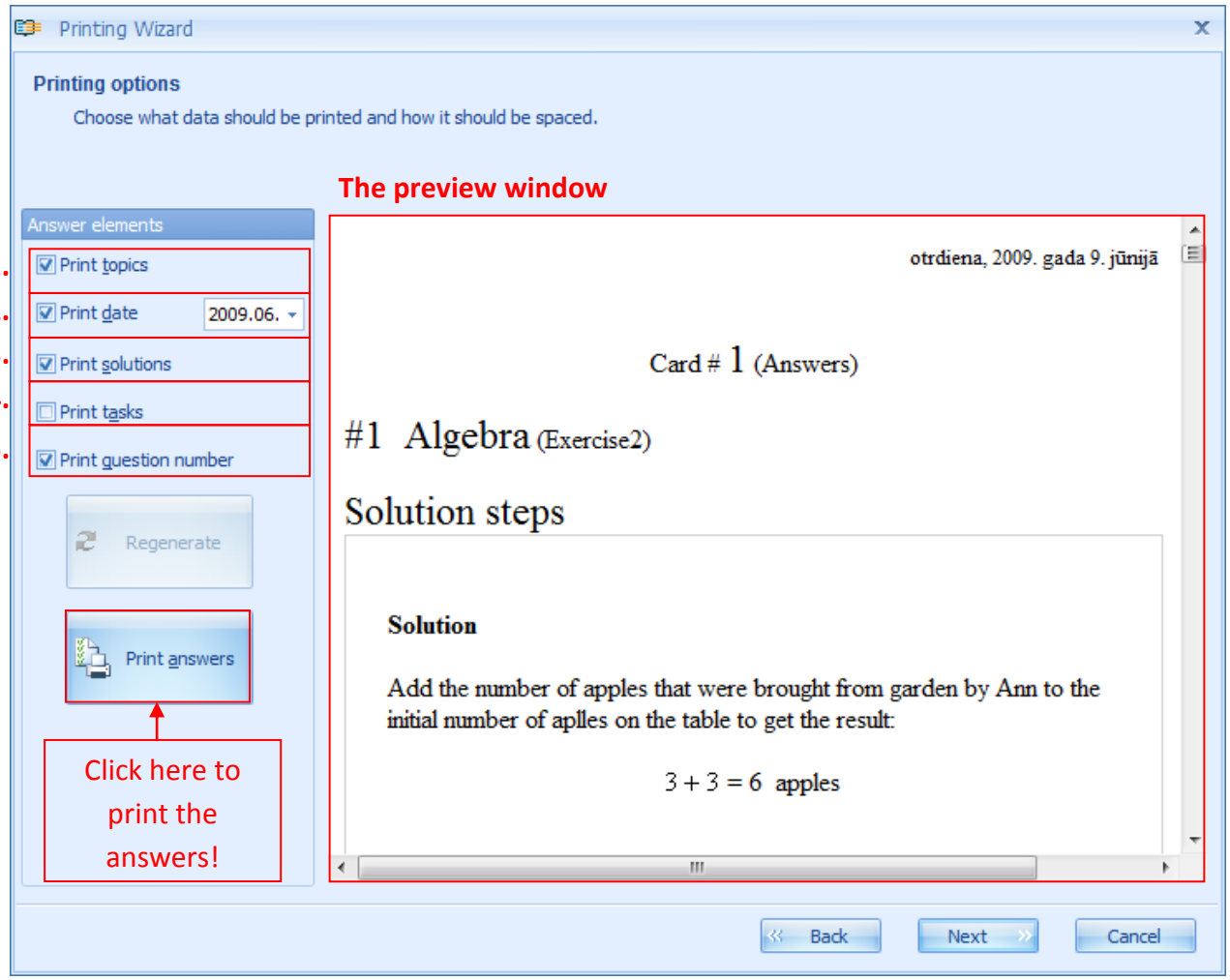
This window offers the opportunity to set the preferable options for the printouts. The user can add

topics [1]; date [2]; space for answers [3]; question number [4] and to choose to print the exercises separately – one on each sheet of paper [5]. In order to set the preferred printout options, the user must check the respective box. As soon as one of the options is checked, the changes will be reflected in the preview window.



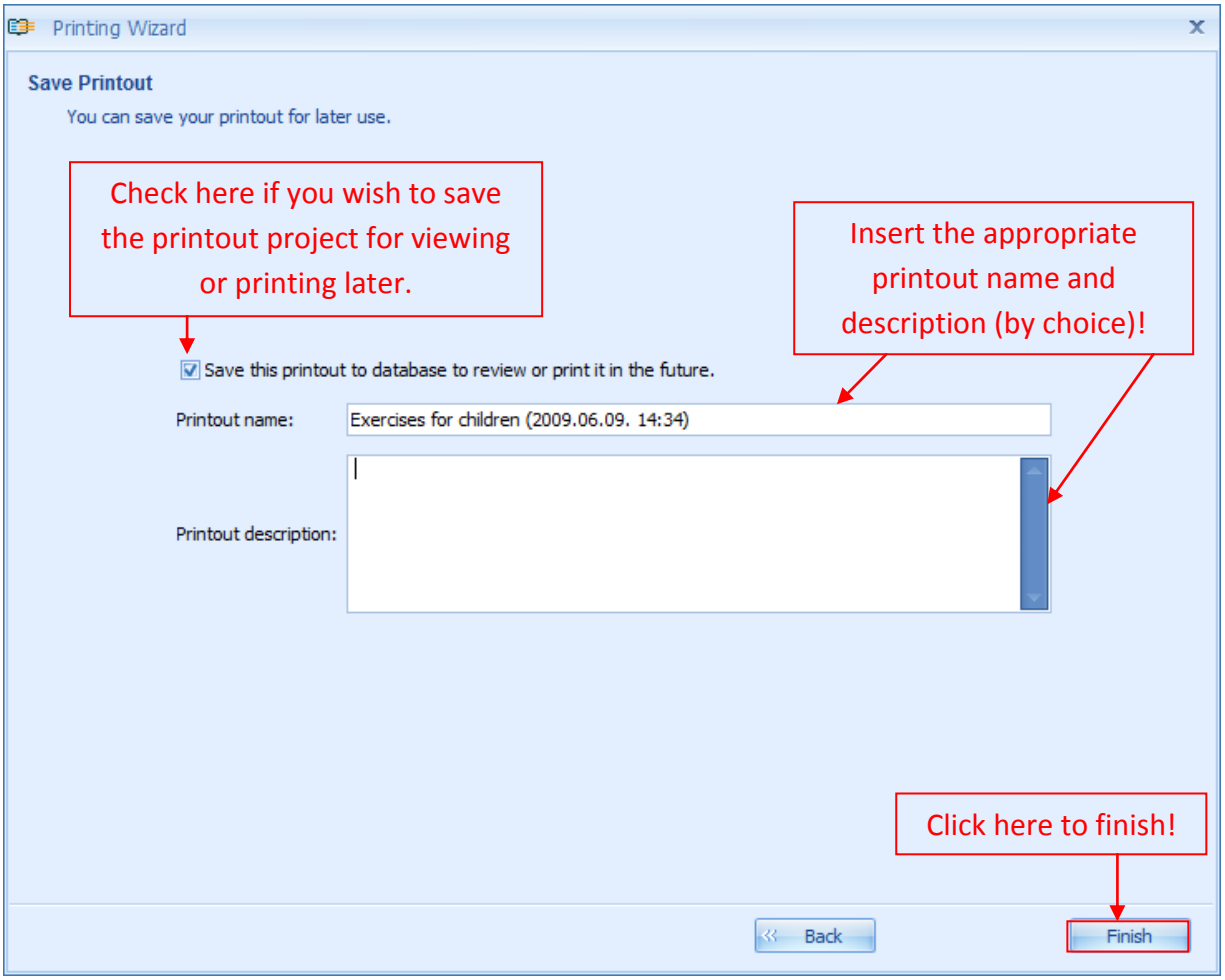
It will be possible to save the prepared printout for later use so the printing process doesn't have to be performed immediately. When the user has chosen the preferable options for the printout and possibly has printed the exercises, click "Next" to go to the next window.

In this window the user can in the same way install the necessary options for printing the answers. The user can add topics [1]; the date [2]; the steps for solutions [3]; the question (exercise) [4] and the question number [5] for the printout. In order to install the preferable exercise printout options, the user must check the respective box. As soon as one of the options is checked, the changes will be reflected in preview window.



It will be possible to save the prepared printout for later use thus the printing process doesn't have to be performed immediately.

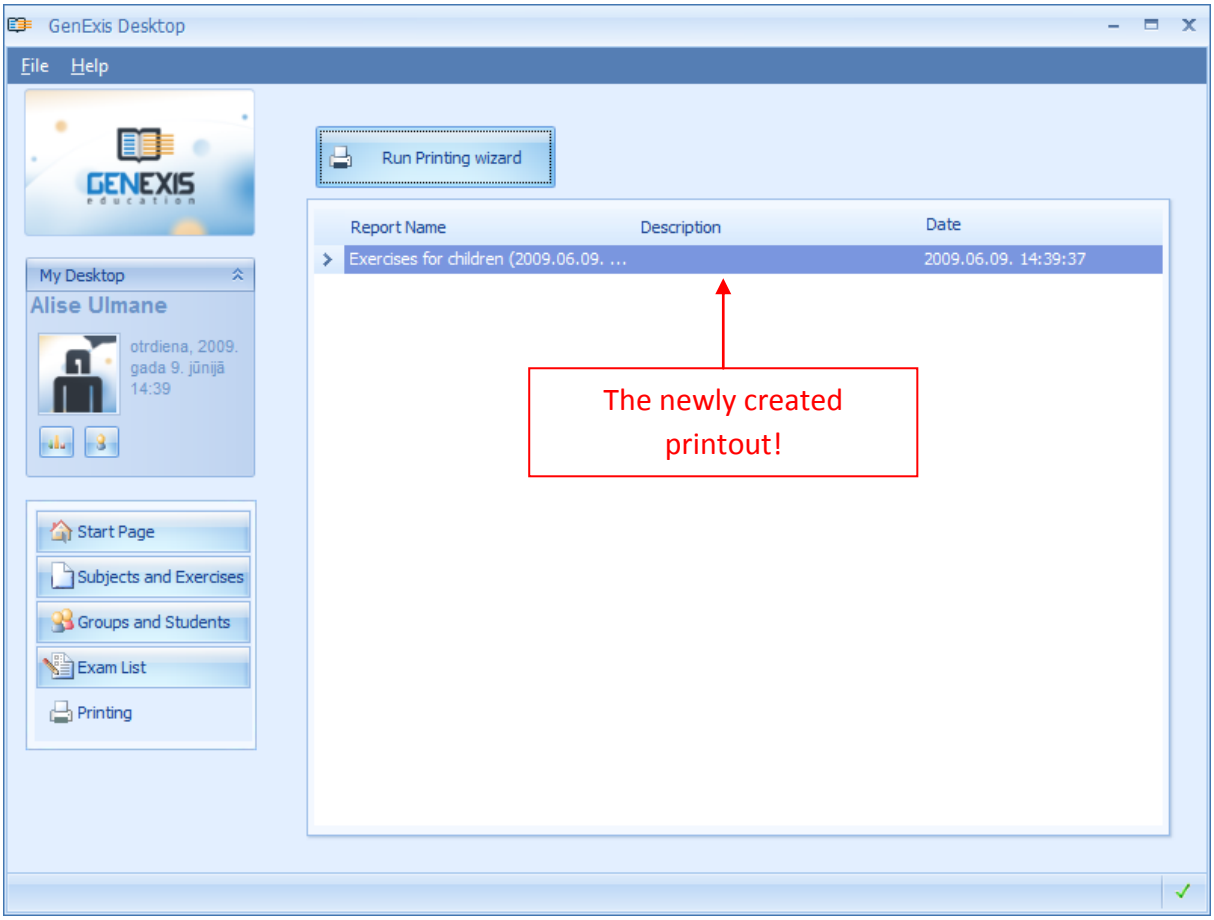
When the user has inserted the preferable options for the printout and possibly has printed the exercises, they must click “Next” to go to the next window with the option to save the printouts.



If the user doesn’t choose to save the printouts then after clicking on “Finish” the system will close the printout preparation wizard without saving any information (in this case the printouts must be made duly!).

If the user chooses to save the printouts, then it is essential to assign the printouts with an explanatory name (in order to be able to find and identify the necessary materials in the printout list quickly).

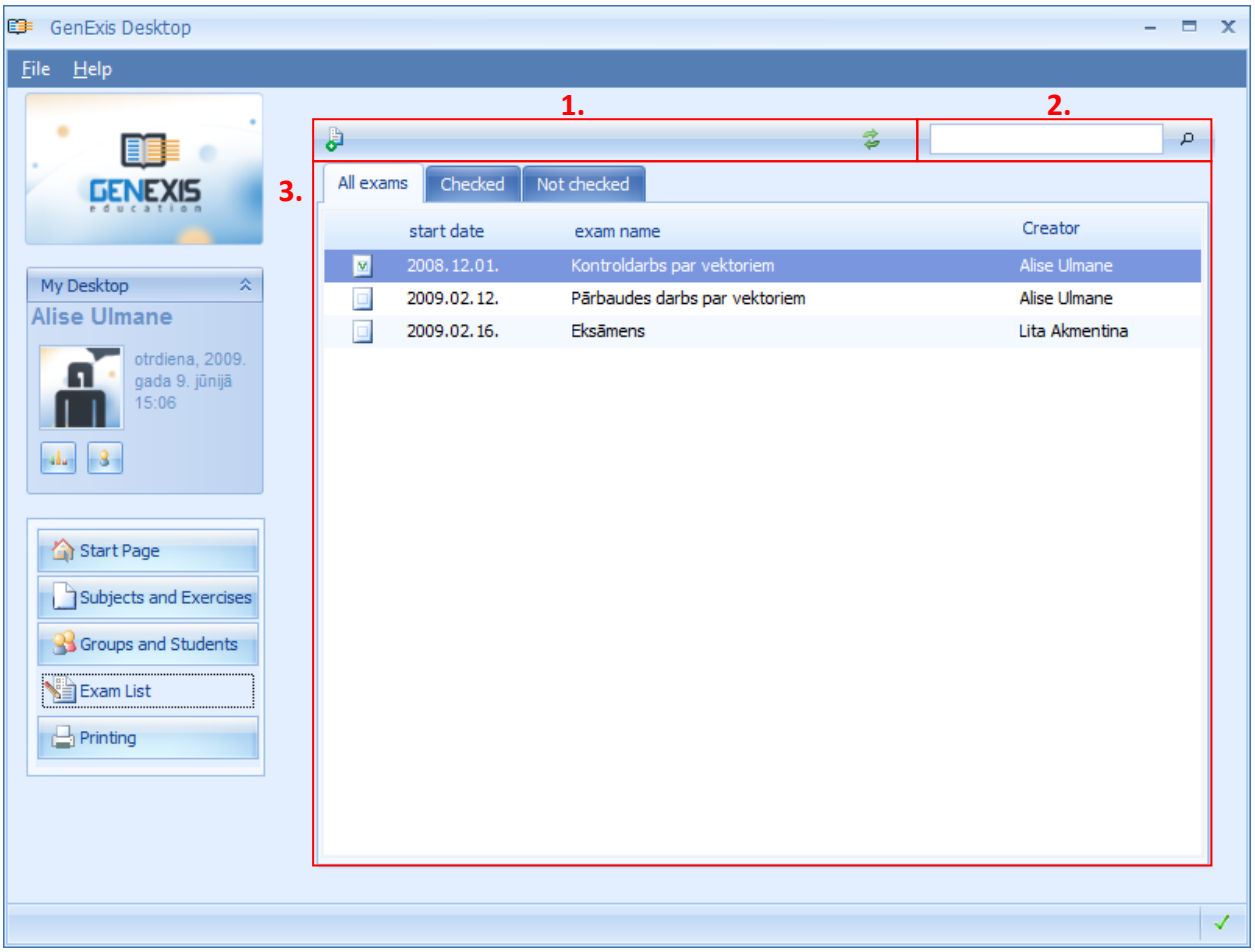
By clicking “Finish” the newly created printout will be added to the overall list of printouts (its description consists of the name, description, date and time).



When the user needs to review or print the created materials, the section “Printing” must be opened and the necessary printout project must be found in the available list. It then can be opened by double clicking on the name. This view offers the user to preview the exercise versions (it will not be possible to change the exercises or the number of versions for generating) as well as to reinstall the printing options for exercise and answer printouts and to reprint them and save them as a new printout project. If the user wishes to exit this format it is possible to press “Cancel” at any moment (no new information will be saved) or to go through all the steps and choose “Finish” at the end.

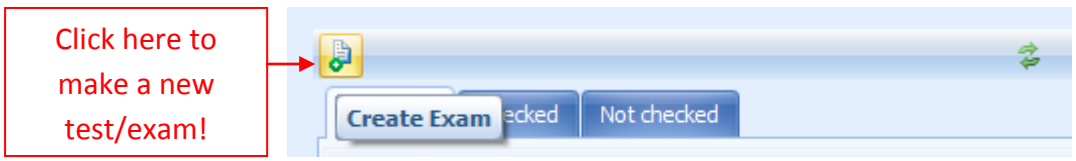
Theme 17: How to create an exam?

In order to create a new control work / test / exam the user must open the section “Exam list” (see Theme 2). In this section the user sees a list of already existing exams (all available exams are shown in the section “All”; section “Checked” shows all tested exams; the section “Not Checked” shows all the completed but unchecked exams; the section “Private” shows all prepared private exams which are not yet completed; rarely the user can see all the previously mentioned sections because each sections appears only when an exam corresponding with the specific feature has been created) [3], the tool bar [1] and the search [2].

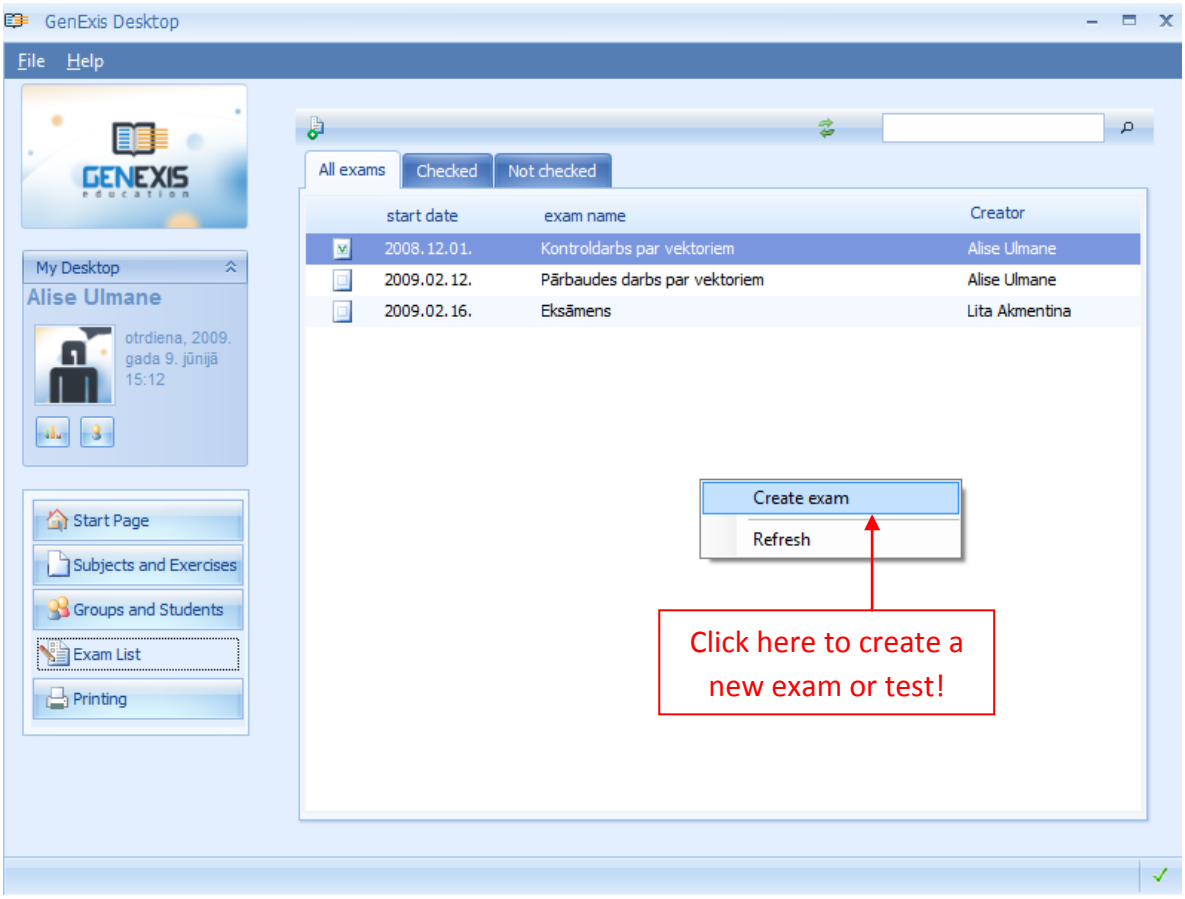


There are two methods to start creating an exam: by using the tool bar or by opening the menu with the right mouse button.

Method 1. By clicking on the icon located at the beginning of the tool bar the user can open the exam creation form. When the user goes on this icon, a sign “Create Exam” appears and the user can open this form with one click.

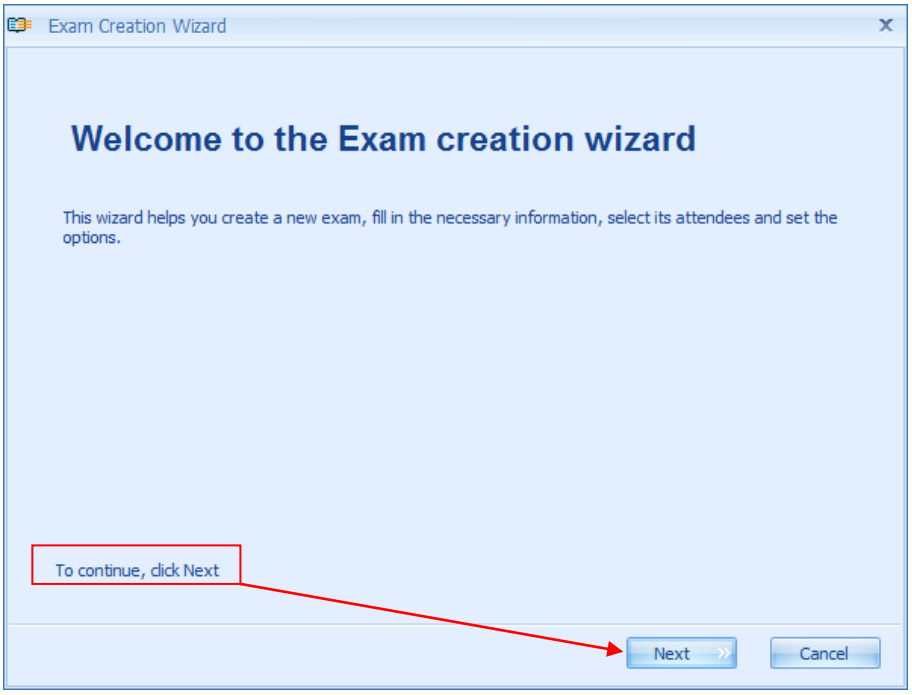


Method 2. Click the cursor anywhere in the free space of the exam list and press the right mouse button – this will open a list of options. To open the exam creation wizard, click once on “Create exam”.

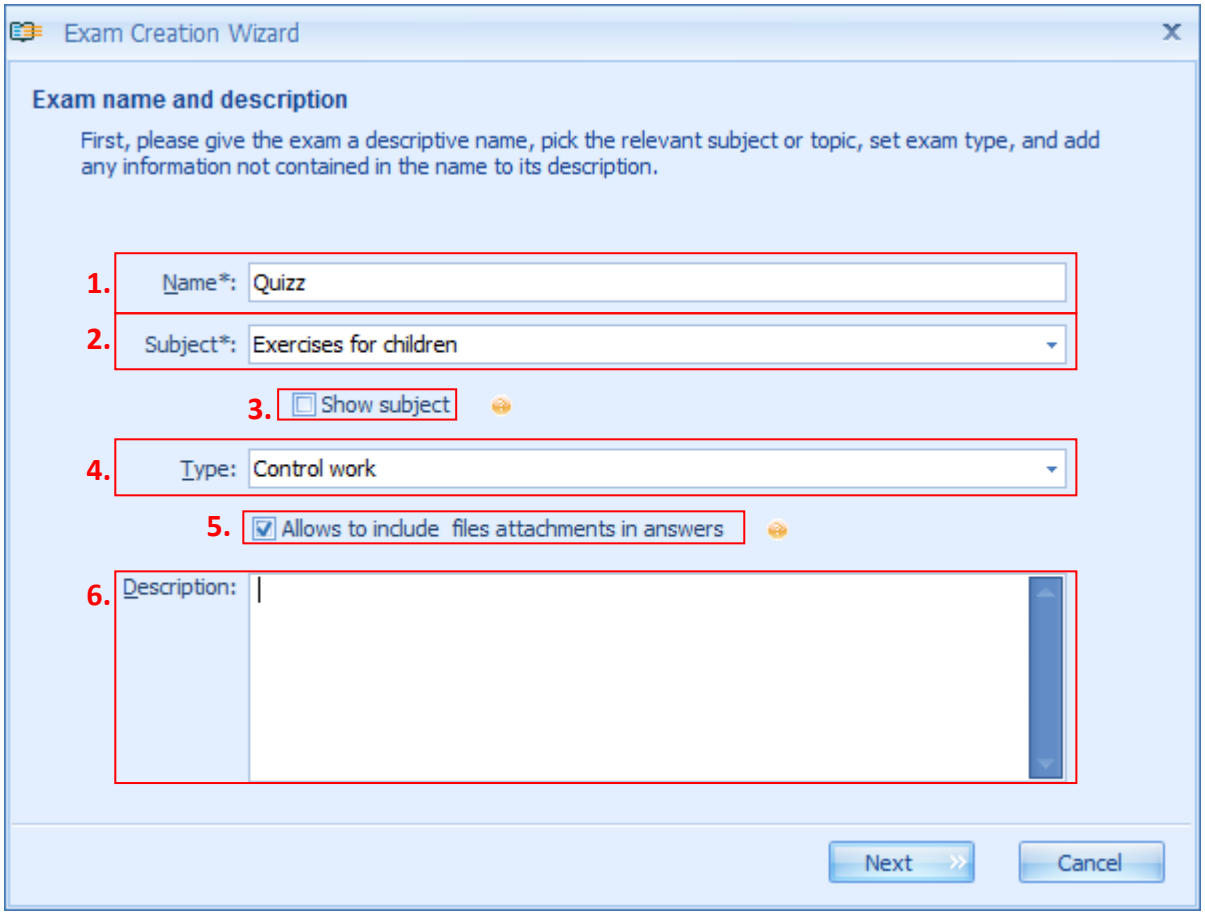


When the user has selected one of the methods for creating a new exam, the system opens the exam creation wizard. To begin working, click “Next”!

If the user wishes to exit this wizard without saving the work, click on “Cancel” (this can be done at any stage of the exam preparation).

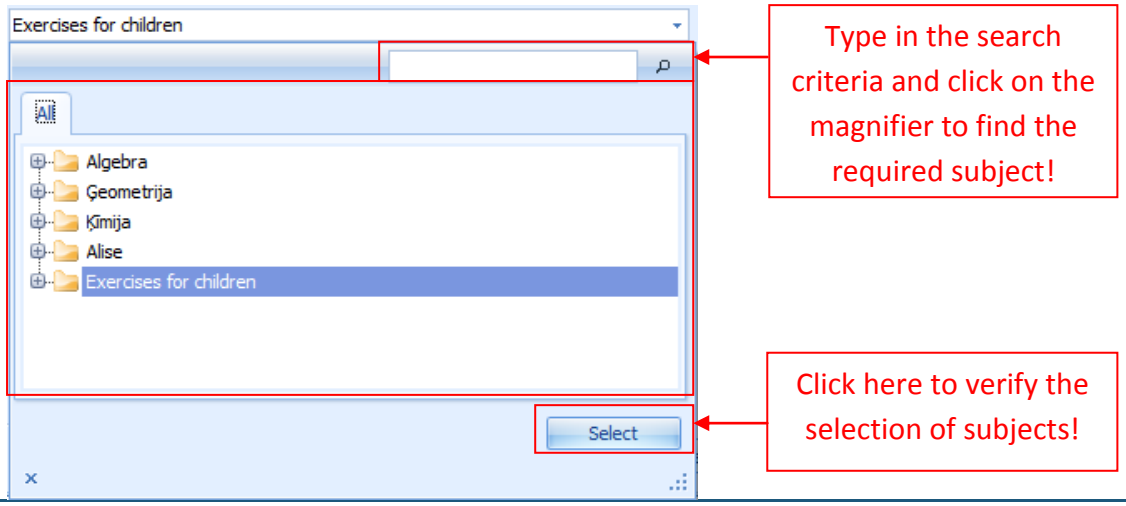


At the beginning of the test or exam creation process the user must insert the following information: the exam name [1], the subject [2], the type [4] and the description (optional) [6] as well as choose whether to show the exam subject [3] and allow file attachments in answers [5].



To enter the exam name, click the cursor in the empty box next to “Name” [1] and type in the adequate exam name.

To enter the exam subject, click the cursor in the empty box next to “Subject” and it will open the available theme and sub theme tree. To find the necessary subject or to select from the available theme and sub themes tree, type in keyword(s) or syllables.



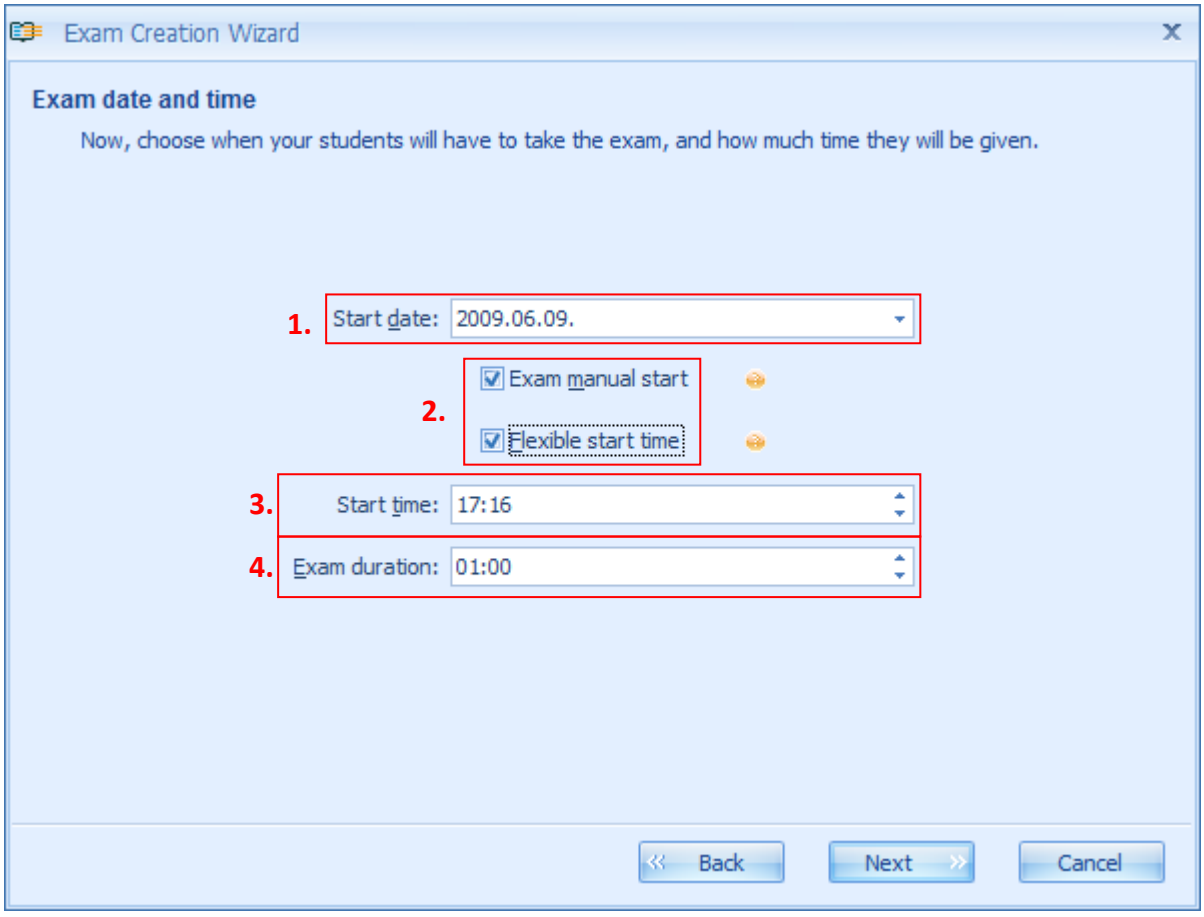
Verify the selection of the subject by clicking “Select”! If you wish to show the exam subject, check the box “Show subject” [3].

To determine the type of the exam, click the cursor in the box next to “Type”. When the menu opens (it will consist of 3 possible types of exams: Control work, Semester work, Year work), choose the most suitable one.

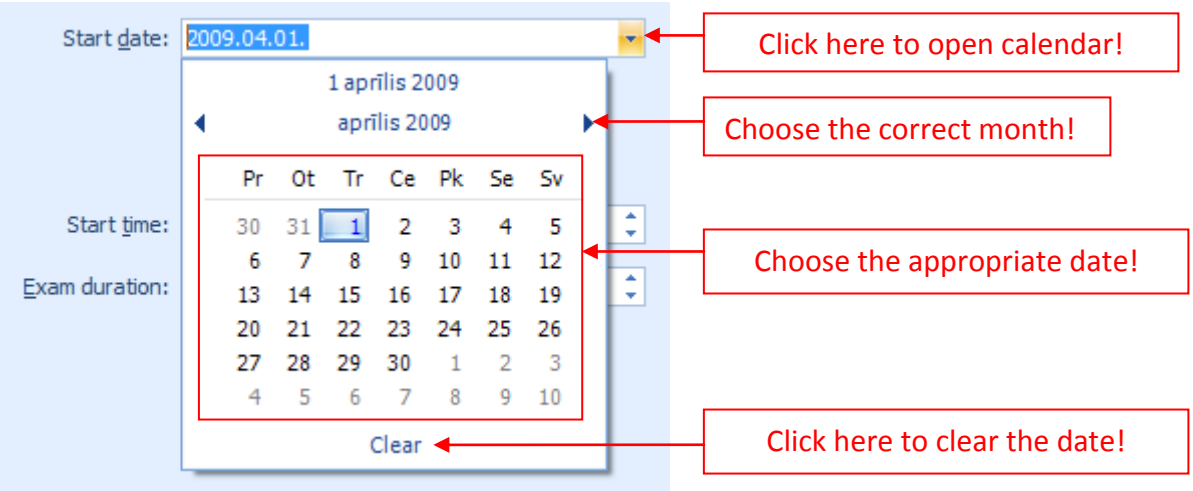
If you want the student to be able to attach additional materials to the answers (for example, pictures or an explanatory document), check the box next to “Allows including files attachments in answers”.

The user can type in any additional information in the description part which could be interesting to students or help the teachers to identify the specific exam in the overall list.

As soon as the obligatory boxes – the exam name and the subject – are filled out, the system will allow the user to go to the next stage of exam preparation. Click “Next” to go to the next window where the user must type in the date [1], and the time [3] when the exam will start, and the exam start options [2] and determine the duration of the exam [4].



The exam start date [1] can be typed in manually or the user can open the calendar and choose the appropriate date.

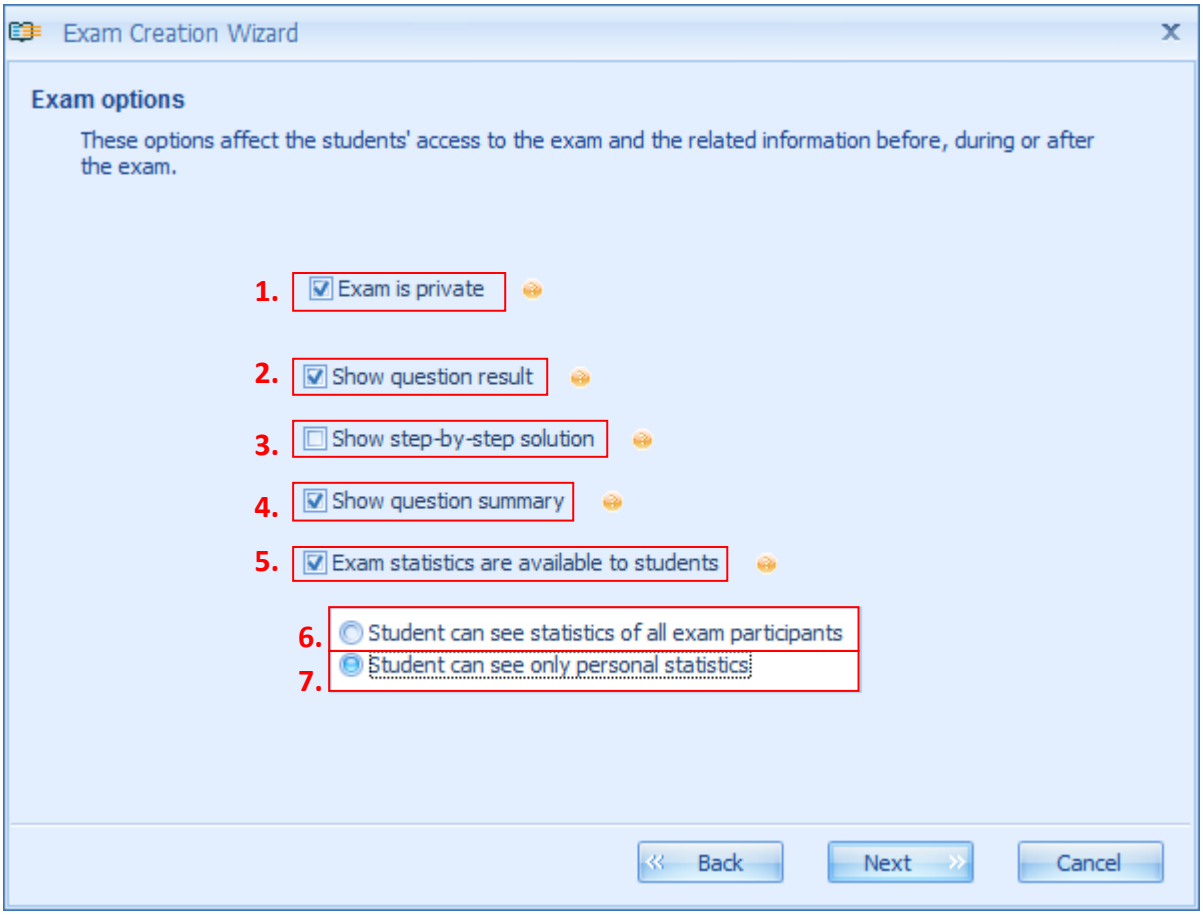


The next step is to select the exam start options [2]:

- *"Exam manual start"* means that the exam (even though it has a specific start date) must be launched manually (see Theme 18). If you prefer the exam to begin automatically on the chosen date, **do not** check the box next to this option!
- *"Flexible start time"* means that the student or any other user who has to take this exam can begin the exam at any time in the time period from the start to the end of the exam (the start time + duration = ending time) and they will still have the time set in the duration section to finish their work. In case this option is not selected the user can still start the exam at any time in the time period from the start to the end of the selected exam time but they will not have extra time, only till the end of the exam time. For example: if the exam is selected to start at 2 p.m. and its duration is 1 hour then in case the user starts the exam at 2:30 p.m. and has checked "Flexible start time", they will have time to finish the exam until 3:30 p.m. (1 hour) but in case the "Flexible start time" is not selected, the user will be able to take the exam only until 3 p.m. (30 minutes).

When the exam start options are selected the user has to select the exam start time [3] and exam duration (hours : minutes) [4]. This can be done by using the keyboard or the arrows at the end of the insertion box.

After entering the exam start information, click “Next” to go to the next stage – selecting exam options. These options offer to select to make the exam private [1]; to show question results [2]; to show step-by-step solutions [3]; to show question summary [4]; to allow the students to view the exam statistics [5]: the students can see statistics of all exam participants [6] or only personal statistics [7].



By selecting the option **“Exam is private”** [1], the teacher can create the exam duly (even several months before the planned exam) but the students will not be able to see it in their exam list. The exam and its description will be available to students only after the teacher publishes this exam.

If the option **“Show question result”** [2] is selected then after each answer student submits during the exam, a notice if the answer is correct or not will appear.

By selecting **“Show step-by-step solution”** [3], after each answer student submits during the exam, the correct solution will appear.

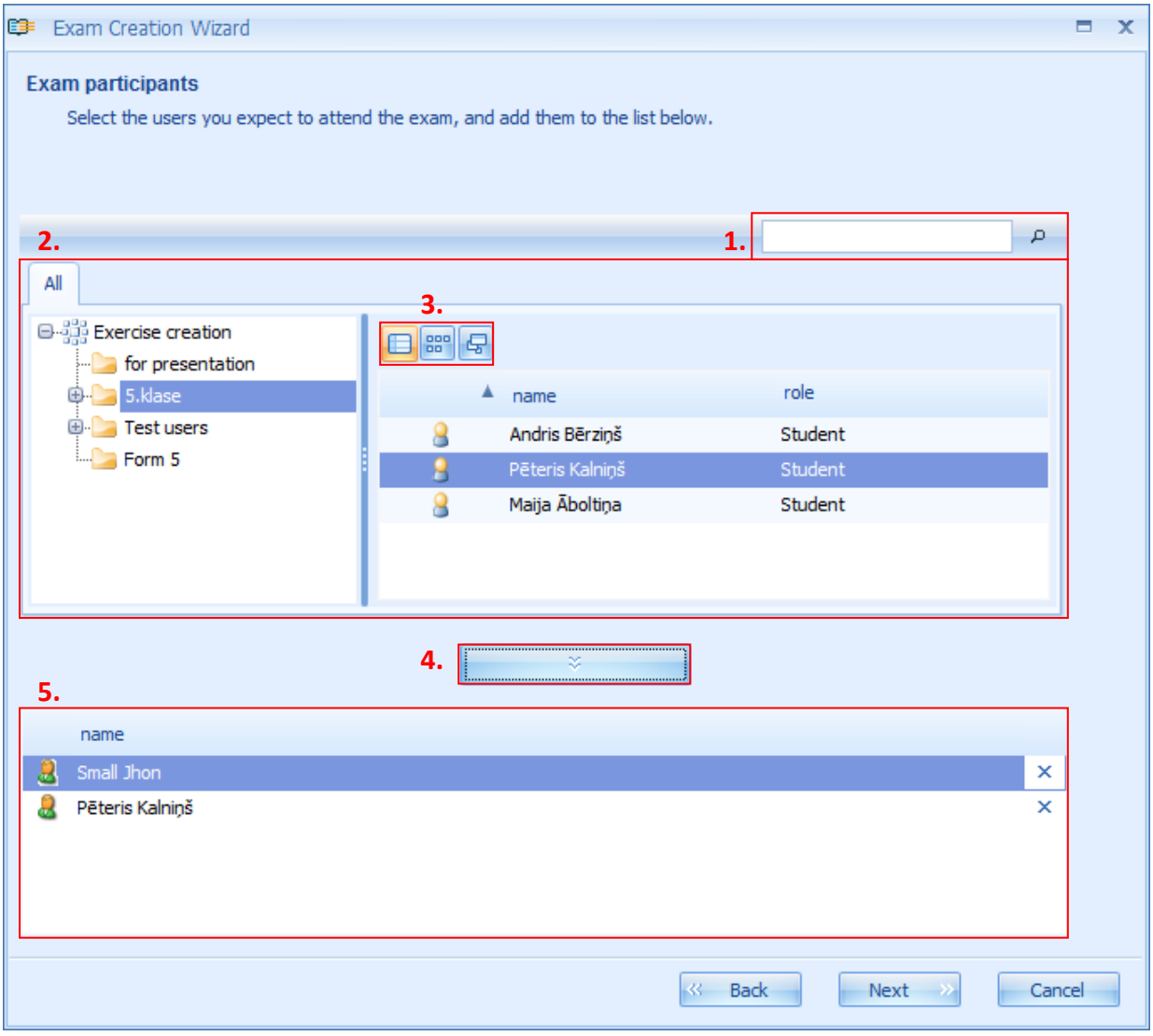
If the user selects the **“Show question summary”** [4] option, the summary of the correctness of the answers (number of exercises with notifications if the student has performed each correctly) will appear at the end of the exam (when the student will have typed in answers to all the exam questions).

By selecting **“Exam statistics are available to students”** [5] the teacher allows the students to access the exam result statistics after the exam is marked as corrected by the teacher. In this case there are 2 additional options: to allow the students to see statistics of all exam participants [6] or

only personal statistics [7].

The teacher can select none, one, some or all the offered options. When all the preferred exam options are selected, click “Next” to go to the next stage of the exam creation process.

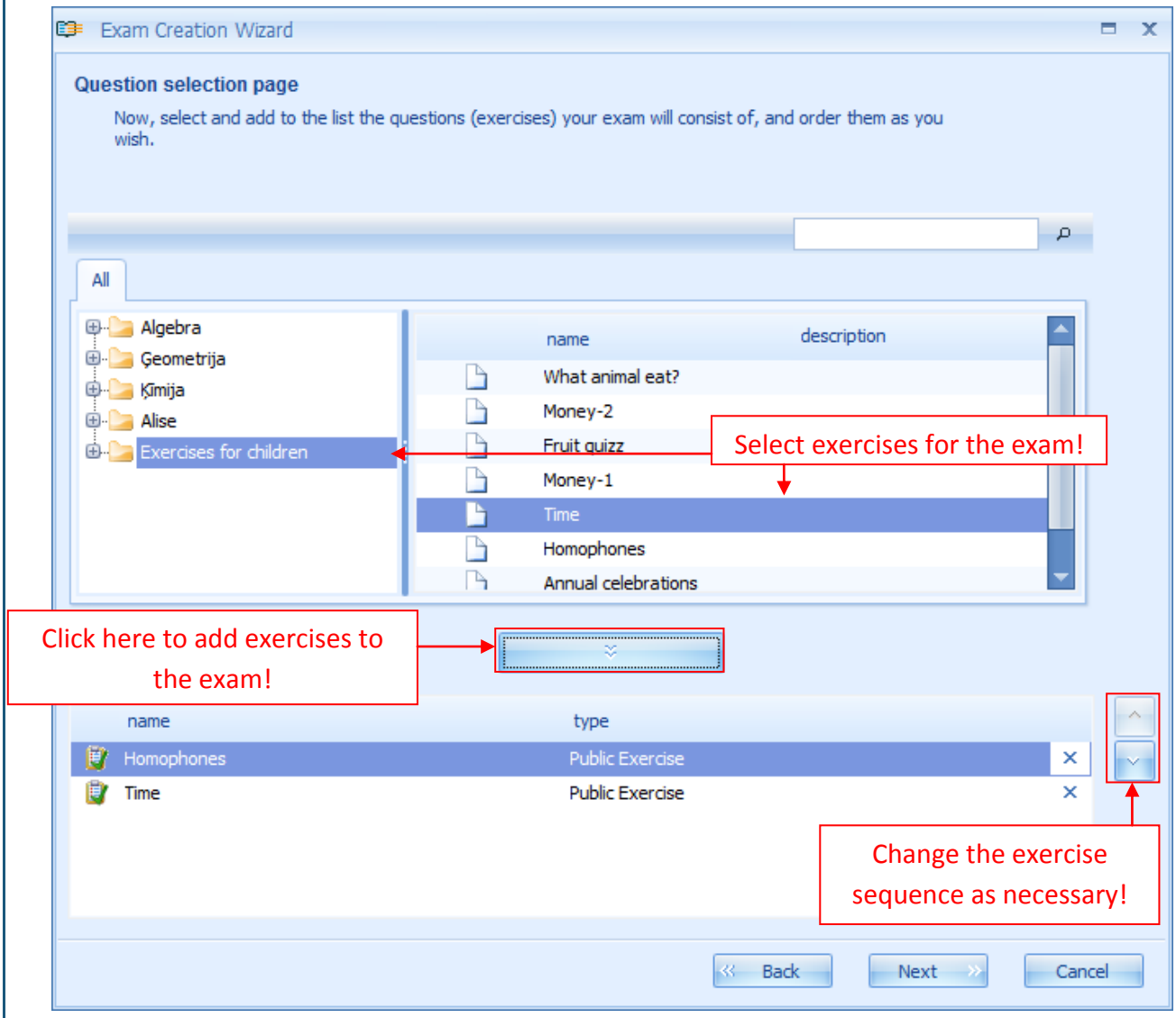
The next step is to choose the exam participants. This can easily be done by using the educational organization, user group and user browser [2] or the search box (by typing in the keyword(s) or syllables and clicking on the magnifier icon next to the search box, the system will select all the user groups and users of educational organization complying with the search criteria and will open the search results in a new window through which the user will be able to add them to the exam participant list the same way as through the browser) [1].



By using the offered view modes the exam creator can change the look of the user browser with the help of the icons [3]. When the planned exam participants are found through the user browser or search they can be added to the exam participant list [5] by double clicking on the participants name or by selecting it and clicking on the add button [4]. By using the add button a whole group of users can be added – the selected user group has to be selected (for example, one class) and then the user has to click on the add button. All the students or other users in the user group will be

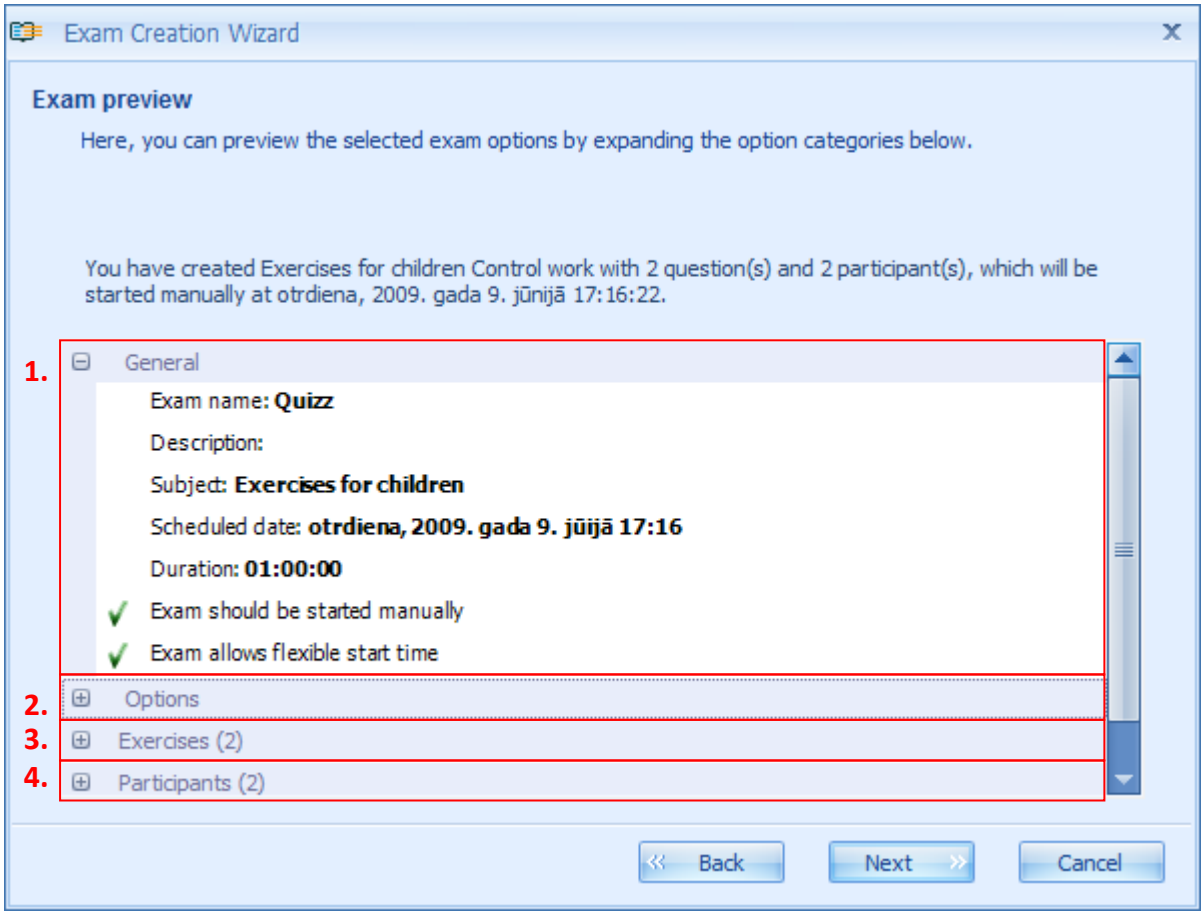
added to the exam participant list. If the user group includes a person not applicable for the exam (for example, the class list includes the class teacher), this user can be easily erased from the list by clicking on the “x” next to the name of the user in the user list [5].

When all exam participants are selected click on “Next” to go to the next stage of the exam creation process. The next step is to select the exercises for the exam. This is done in the same way as in the printout materials (see Theme 16).



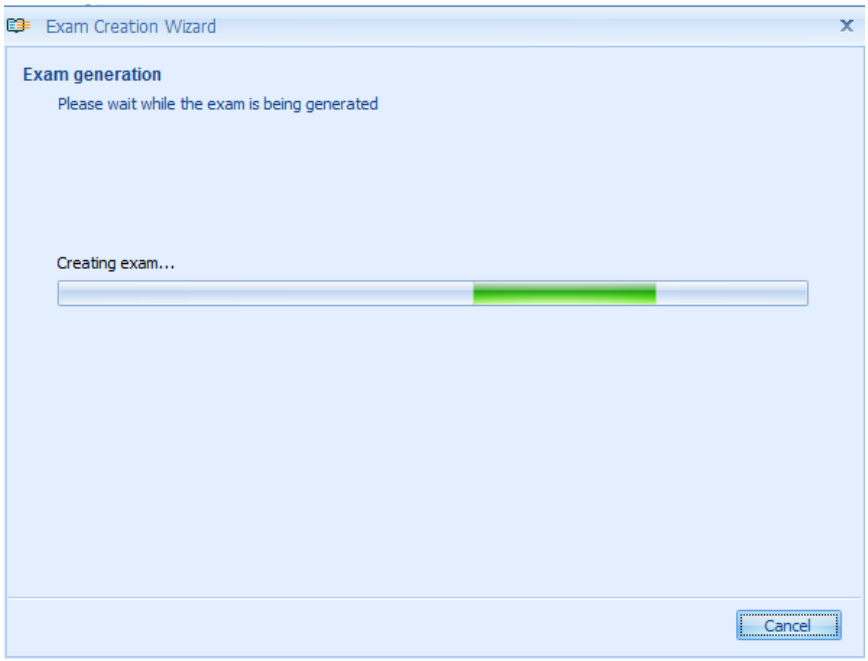
When the exam exercises are selected and arranged in the required sequence, the user must click on “Next” to go to the next exam creation stage.

The next step provides the opportunity to review all the exam settings. The system has summarised all the options chosen by the user under four main topics: “General”, which includes general information (exam name, subject and time preferences), “Options” consisting of all information on the user’s chosen exam settings, “Exercises” offers to view the list of the selected exercises, “Participants” which shows the list of the participants. Further information on each of these sections is opened by clicking on “+” next to the section name.

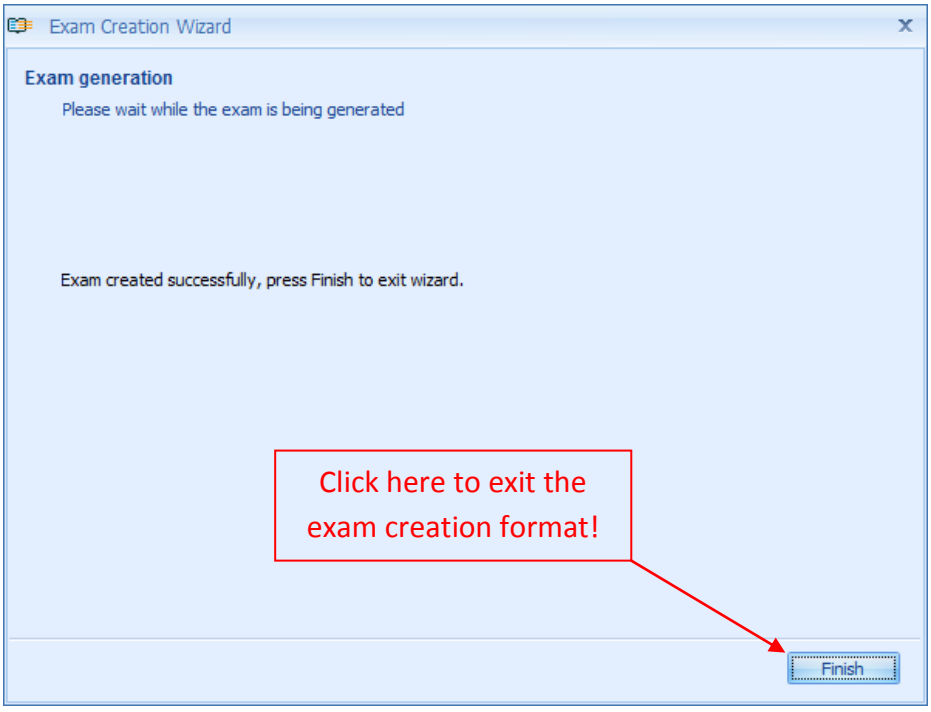


This section is useful for reviewing all the selected exam preferences and if necessary return to one of the previous steps and make alterations. **It will be impossible to do it later.**

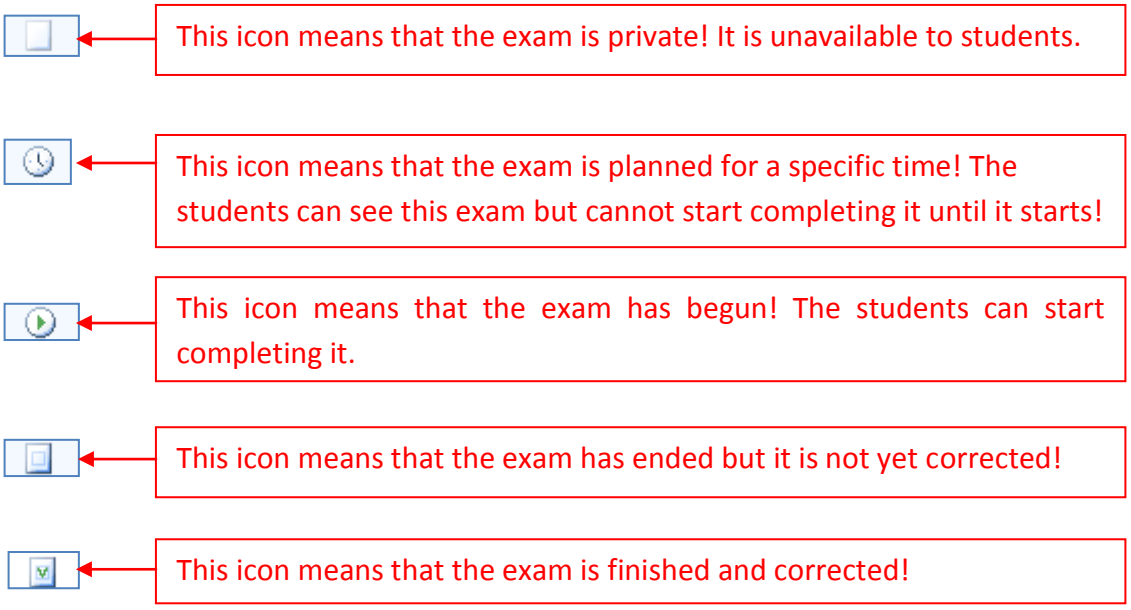
Click “Next” to create the exam! Wait while the exam is being created!



Congratulations on a successfully created exam! Click “Finish” to exit the exam creation wizard.



When you have closed the exam creation format, the newly created exam will appear in the overall list of exams. Different icons are used for illustrating the exam status:

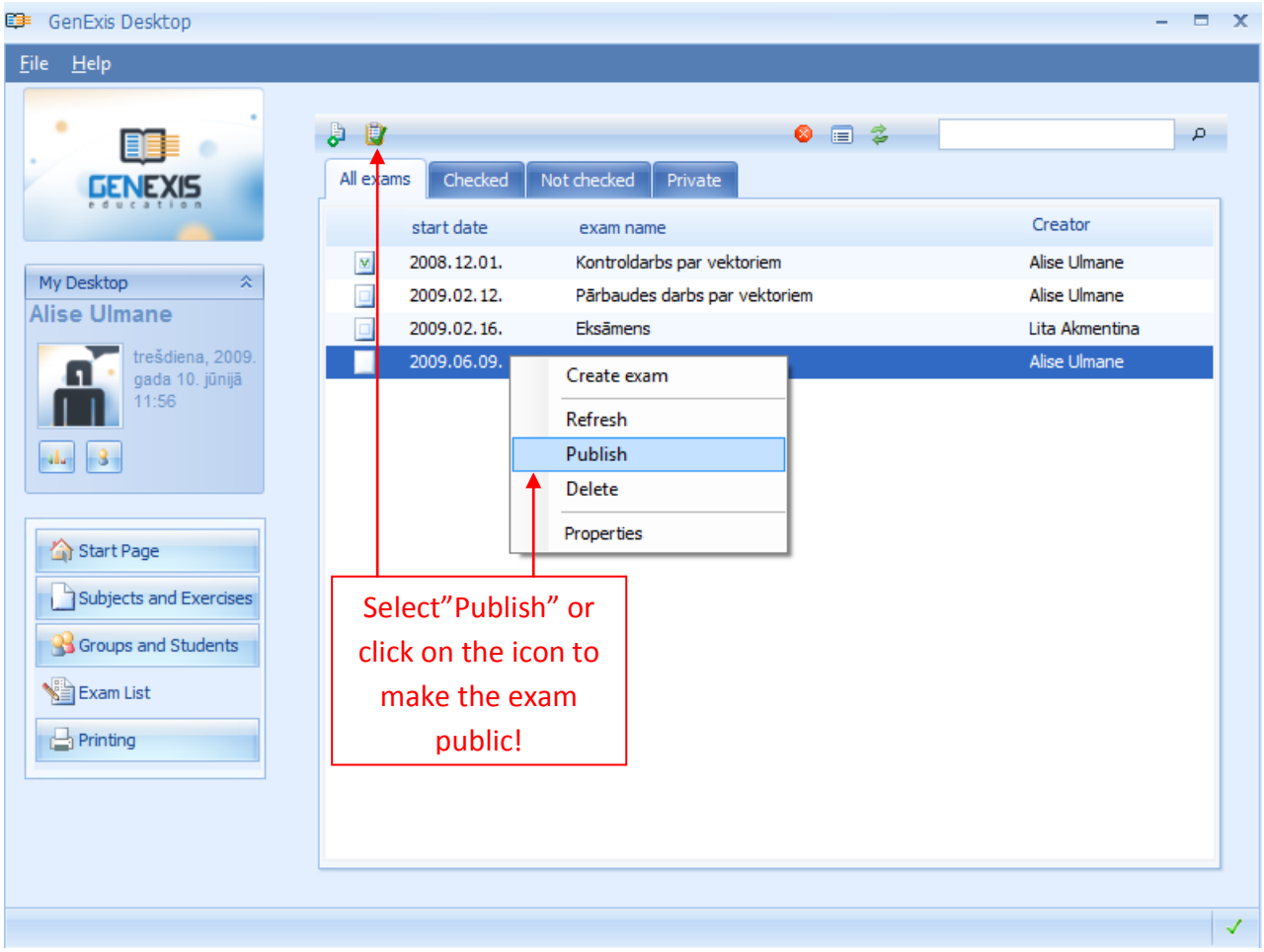


A newly created exam is usually marked with the private exam icon (if it is installed as private) or with the scheduled exam icon.

The properties of the newly created exam can be edited until the exam start time.

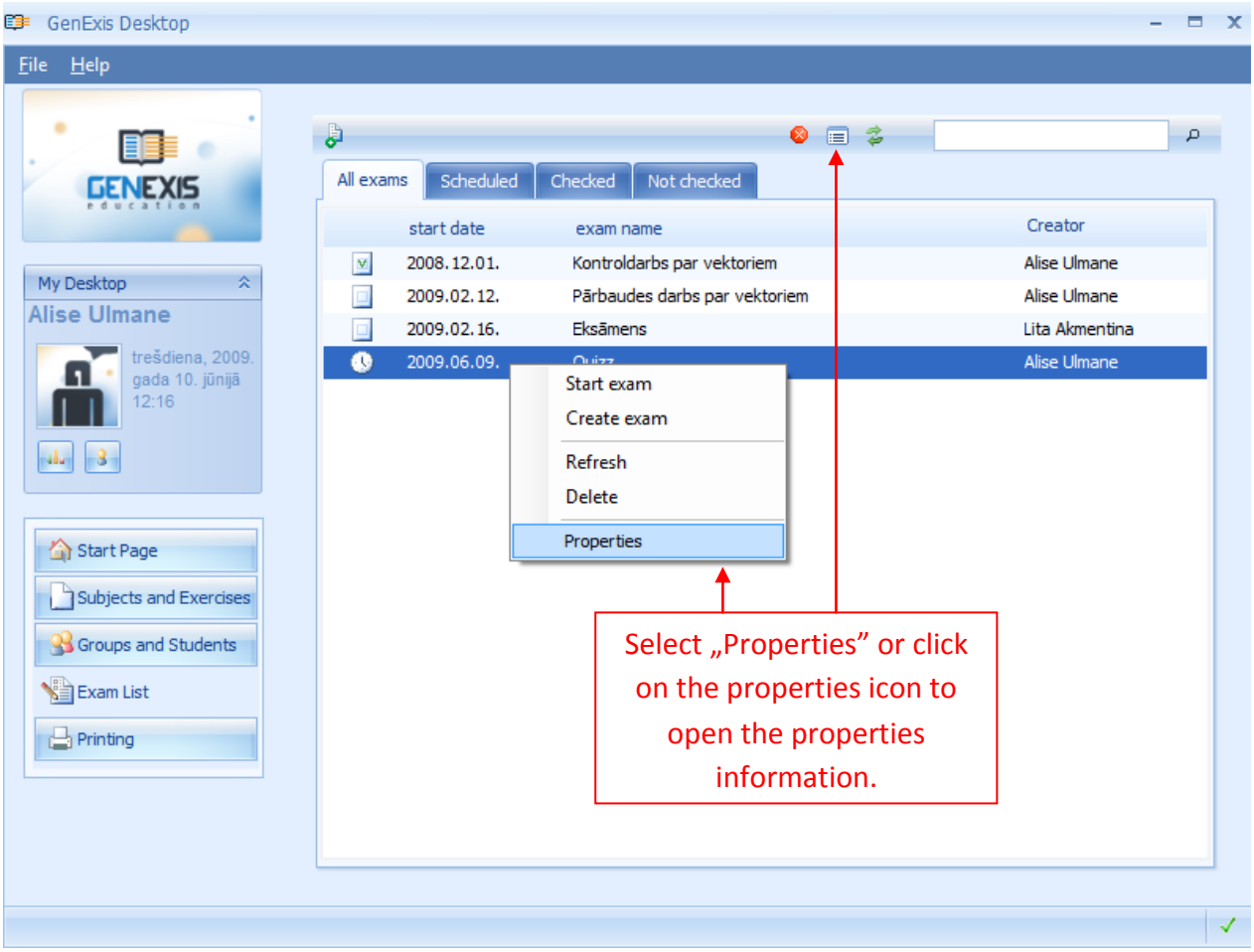
1) How to make an exam public?

It is very simple to make any exam which has been created as private, public. Mark the selected exams in the list of exams or in the section of private exams, press the right mouse button and from all the offered options select “Publish”. The alternative is to select the exam and use the exam publishing icon in the tool bar.

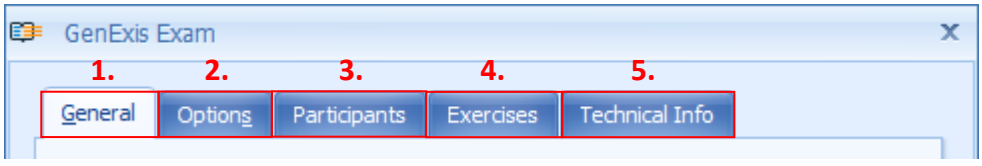


2) How to edit the exam properties?

It is possible to edit certain parts of the exam options before the beginning of the exam. In order to do that, the user must open exam options information.

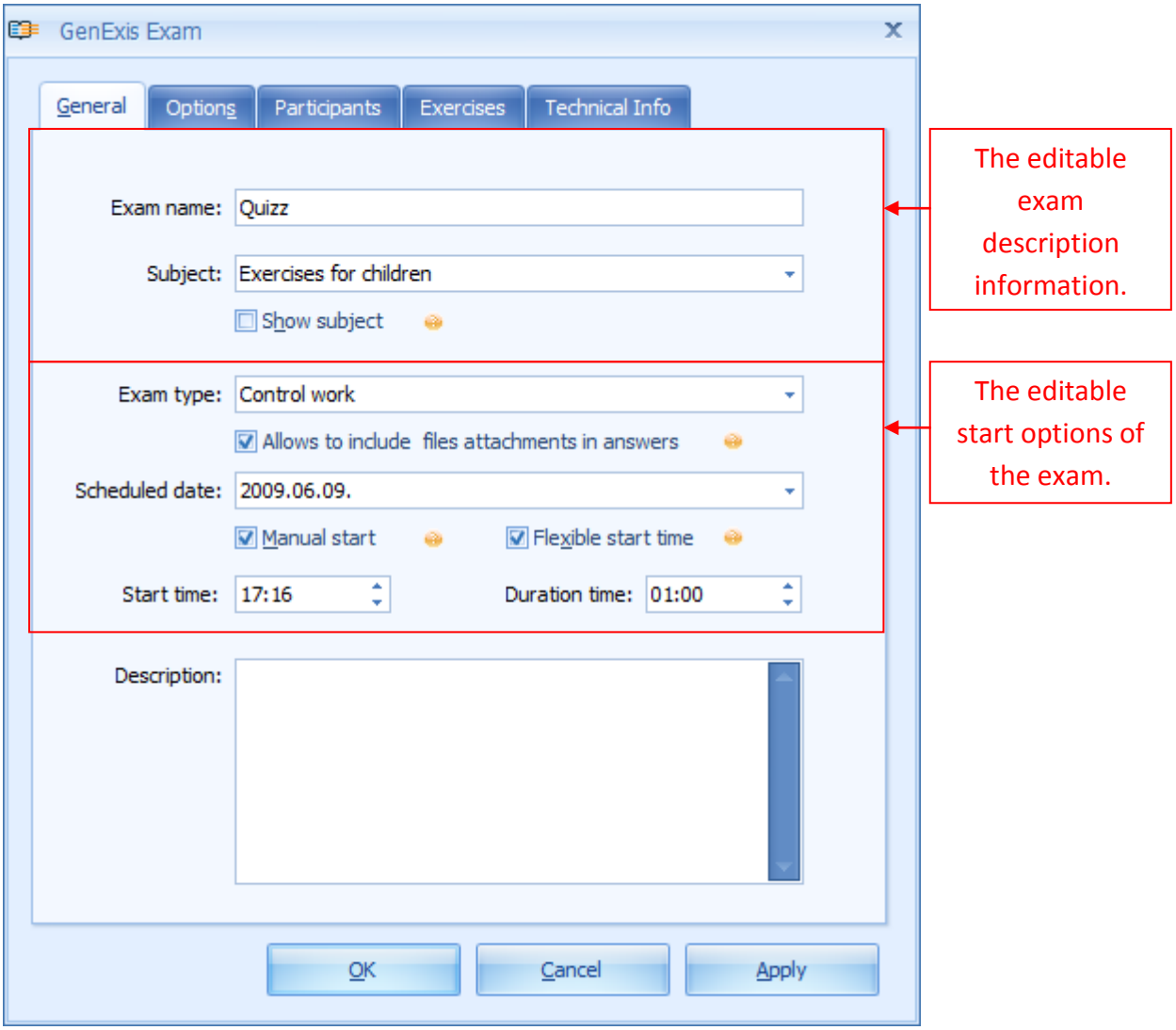


The exam option information consists of several sections. General [1] and Options [2] are sections where information can be edited. The participant [3] section consists of the list of the participants and it is unchangeable. The exercise [4] section offers the option to view exercises included in the exam. But technical information [5] includes data on the time of the exam creation, the creator as well as the last time it was modified.



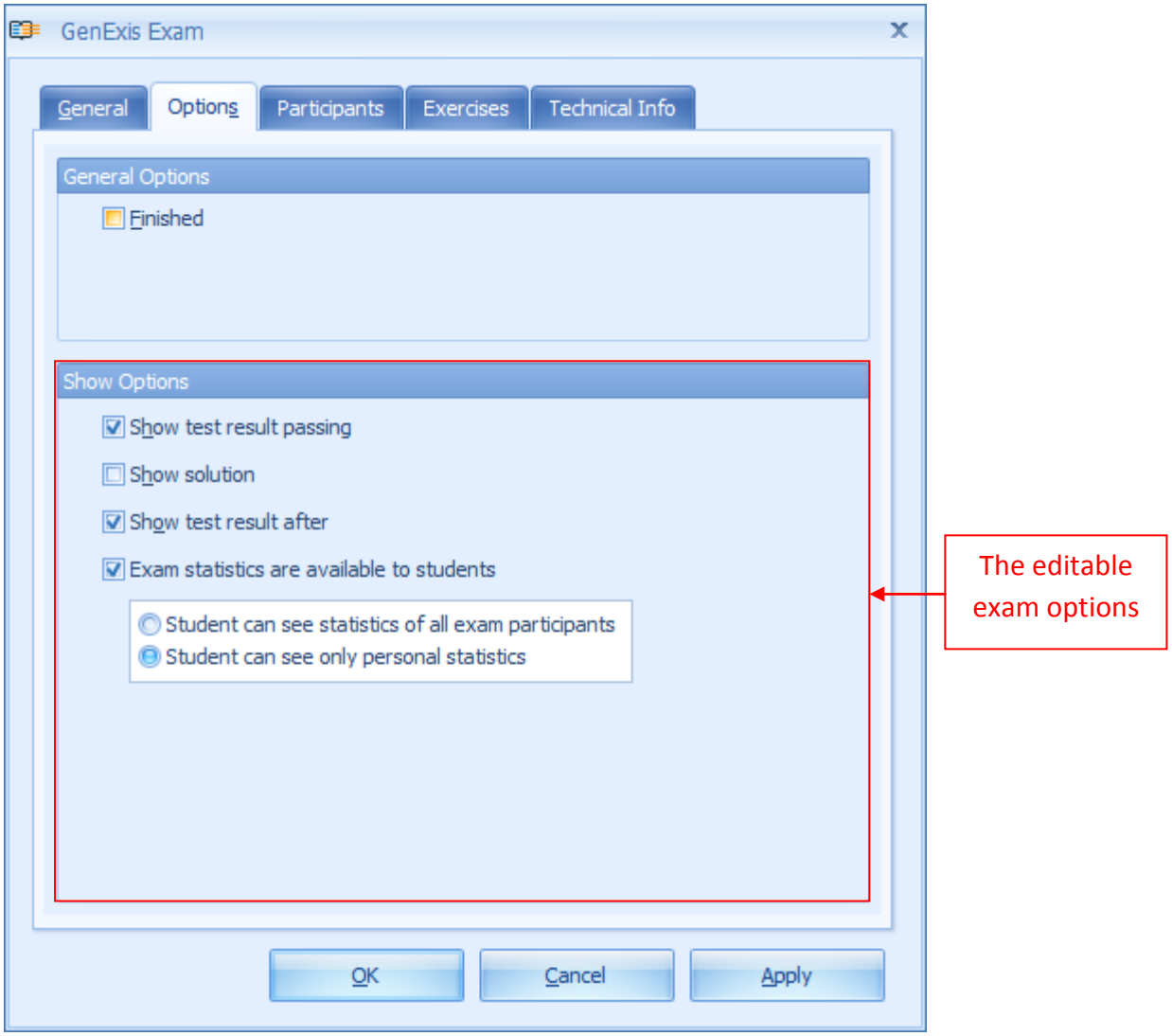
The general information section in the exam options presents the opportunity to review and edit information entered in the first two exam creation stages: the exam name and subject, the type of exam, the planned date and time of the process, the description, etc.

When editing the exam name or subject it's essential to remember that the exercises included in the exam are unchangeable.



When you have finished all necessary alterations in the general options of the exam, click on "Apply" to save the input information and to continue editing or viewing the exam options. You can also click "OK" to save corrections and to close the options information or click "Cancel" to close the options information without saving any changes.

It is possible to edit the chosen exam options for the students' accessibility of results and solutions. The nature of options is analogue to the ones that were selected during the exam creation.



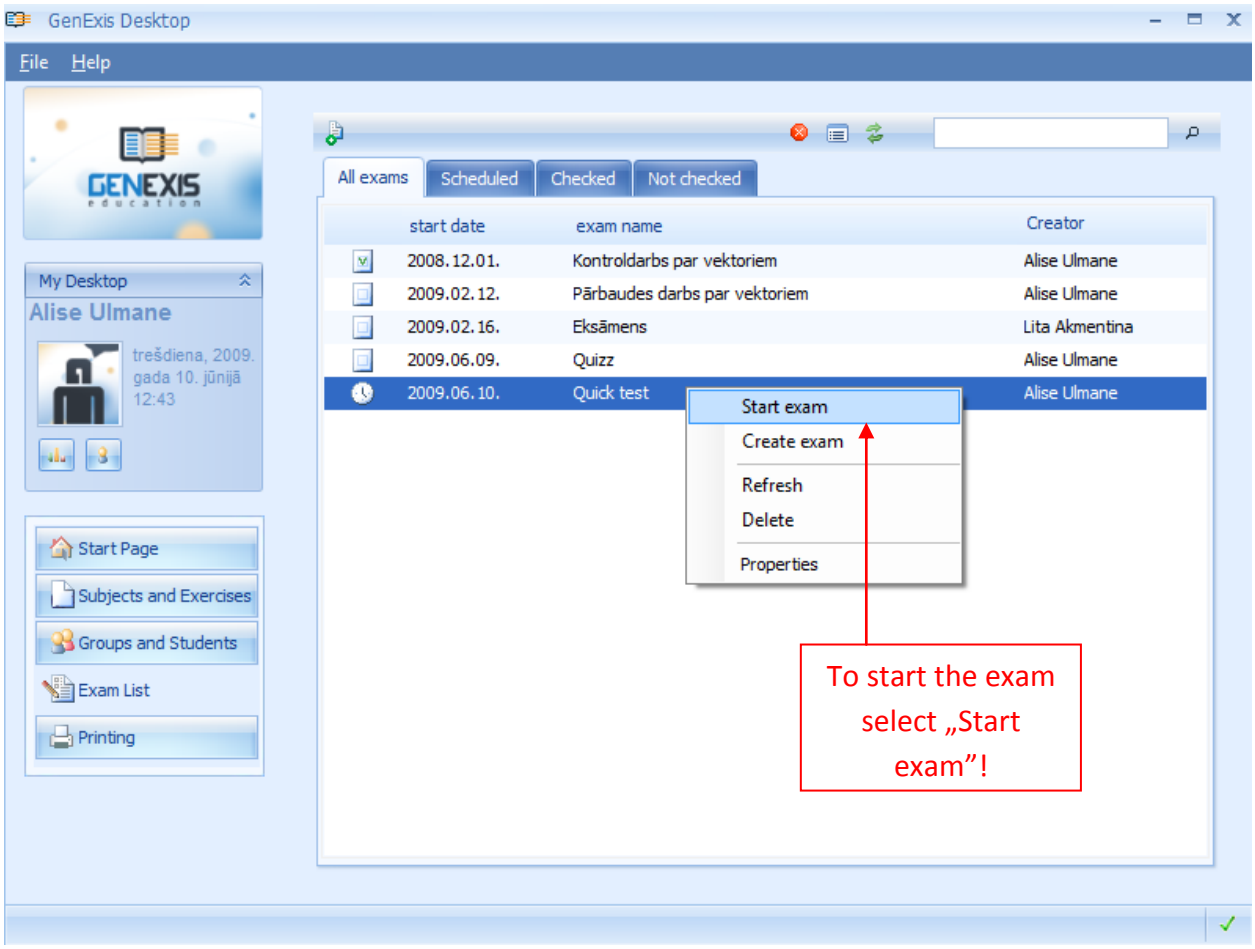
The changes of these options are saved in the same way as the general information changes.

Note: it is impossible to make changes to the exam once the exam has begun!

Theme 18: How to start the exam?

The teacher must start the exam if the „Exam manual start" option was selected. If it will not be done, none of the exam participants will be able to start the exam even if the exam time has already begun.

Thus to ensure a successful exam process the teacher must manually start the exam in the time scheduled. In order to do that teacher must open the exam section in the GenExis system and find the correct test or exam in the exam list. It should be marked with the planned exam icon, except if it's formed as private (see Theme 17). Sequentially teacher must select the given exam and press the right mouse button. When the menu opens, the teacher must select „Start Exam".

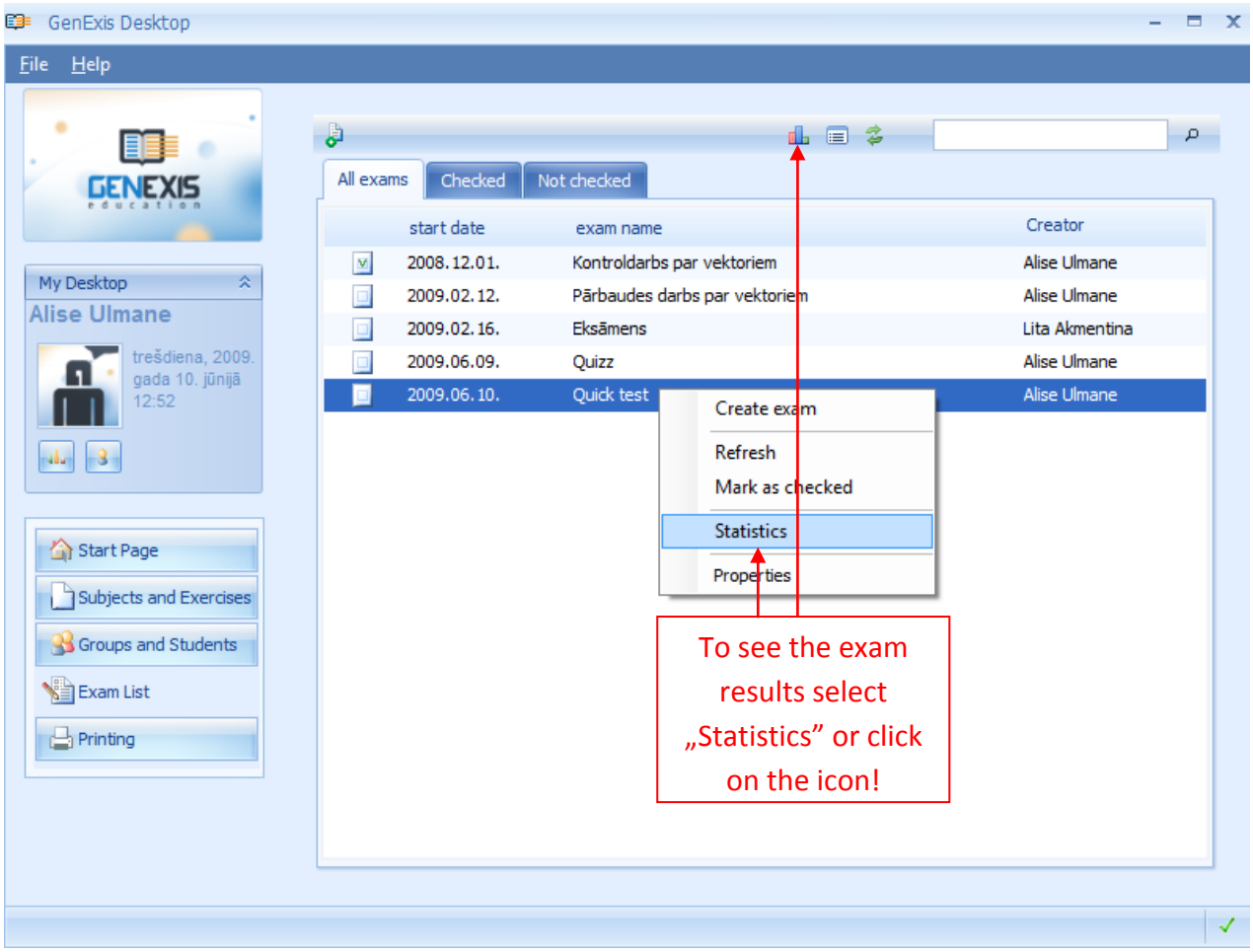


As soon as the previously explained action will be performed, the exam icon will change:

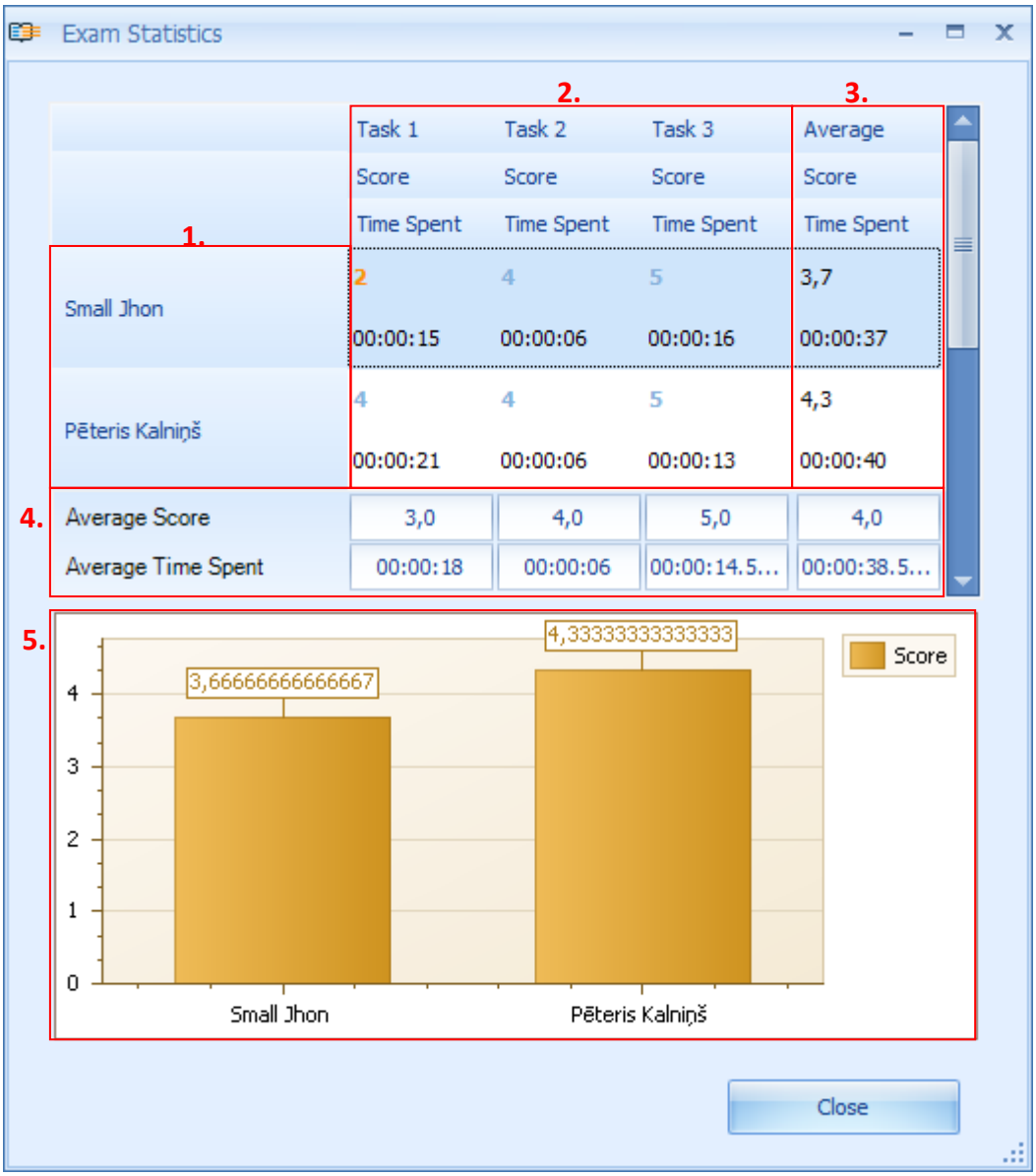
This means that the exam has begun and it will be available to the exam participants.

Theme 19: How to check the exam results?

The exam results are available to the teacher after the exam has been finished (when all exam participants have finished the exam or when the time planned for the exam has ended). These results can be viewed as statistical data which is based on the acquired points for each task and the correct answers. In order to view the exam results the teacher must open the exam section in the GenExis system and find the corresponding test or exam in the exam list. When this is done, they must select the relevant exam and press the right mouse button, and select „Statistics" from the offered menu. The alternative is to click on the statistics icon in the toolbar.



The exam statistics window will open when the user has activated the exam statistics viewing option.

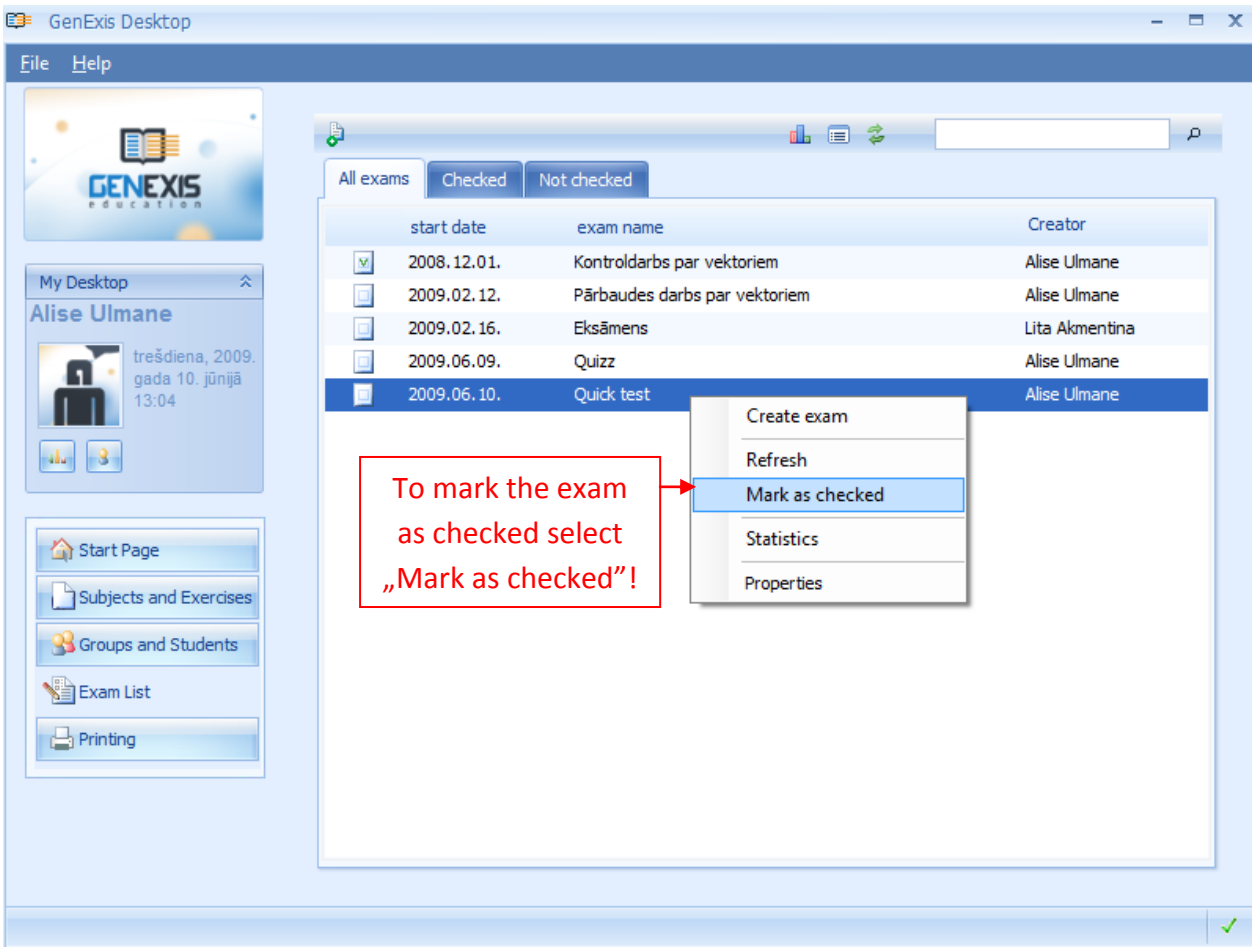


Firstly the exam statistics show all exam participants [1] who were supposed to take the exam as well as the data of exam results [2]. If „ABSENT" appears in a window opposite one of the exam participant's names where the results should be, it means that the respective student has not passed the exam.

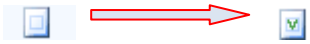
The exam statistics show the result the student has achieved for each task and the time period in which the student has performed each task [2]. In order to see any of the tasks in detail the teacher can open it in a new window by double clicking on the result of the corresponding task (in a similar manner the teacher can open any attached explanatory document added by the student). The GenExis system automatically calculates the average result of the exam for each student [3] and also shows it graphically [5]. The system also calculates the average result for each task [4].

If the teacher is satisfied with the results and accredits them, they can close the statistics window by clicking on „Close”.

In order to make the statistical data available to students (if such option is selected in the setup of the given exam) and to finish the verification of the exam, the teacher must mark the given exam as checked. Again the given exam must be selected in the list of exams, the right mouse button must be pressed and the option „Mark as checked” is selected from the given menu.



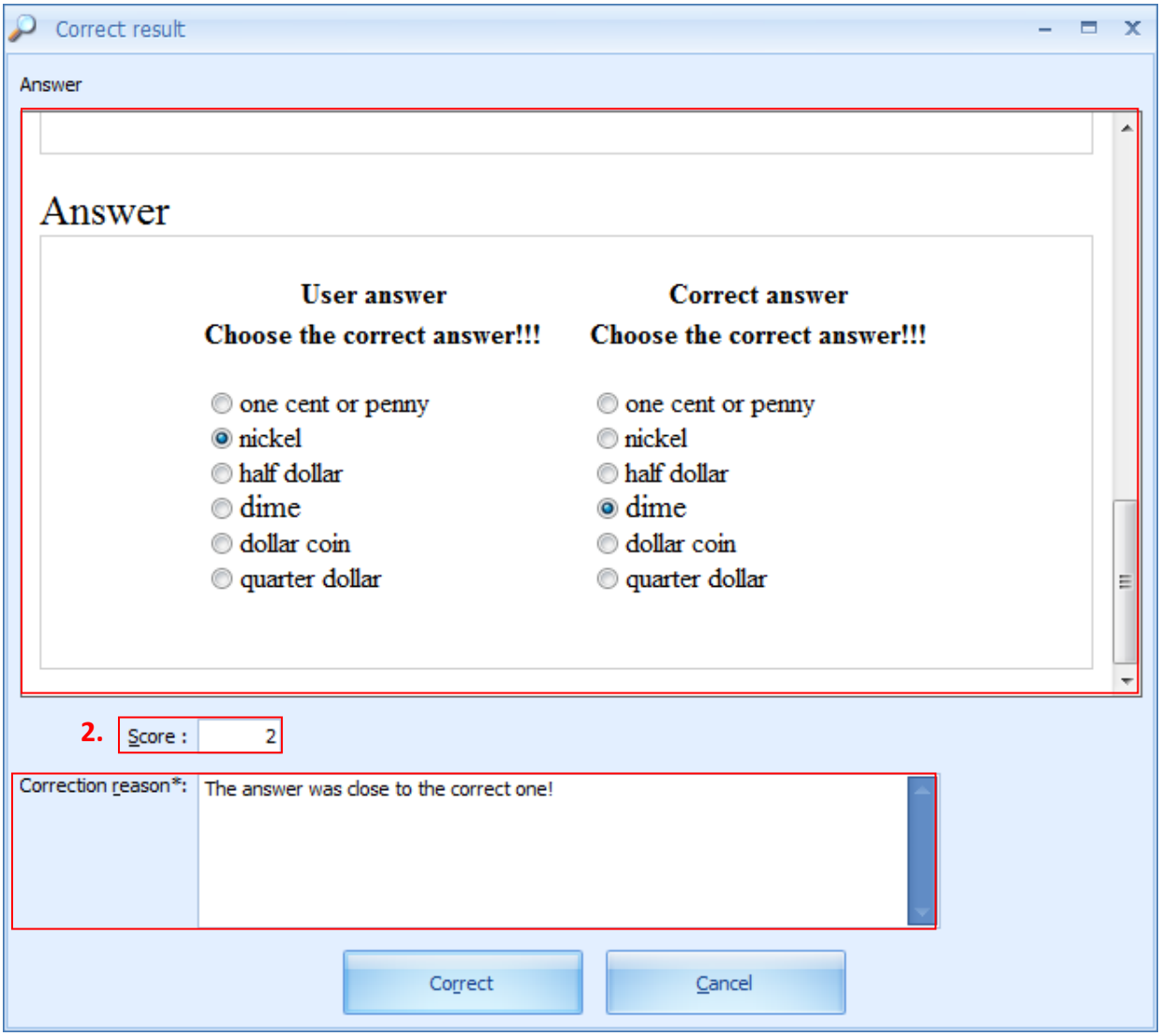
After performing the previously described action, the exam icon will change:



Note: when the exam is marked as checked, the result details are no longer available for viewing and the exam results cannot be edited. (See Theme 20).

Theme 20: How to edit the exam results?

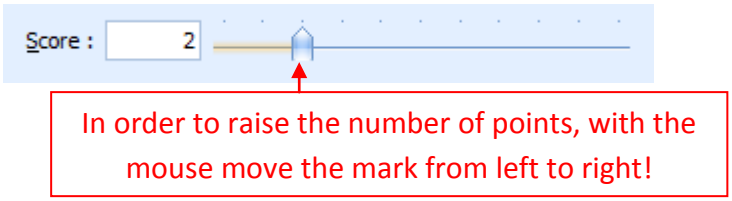
If the teacher considers that the system has inadequately evaluated the student's answer, the GenExis system allows them to edit and correct the exam results. In order to perform this action, the exam must be finished but it shouldn't be marked as checked. First the teacher must open the exam statistics (See Theme 19) and the detailed view of the given exercise:



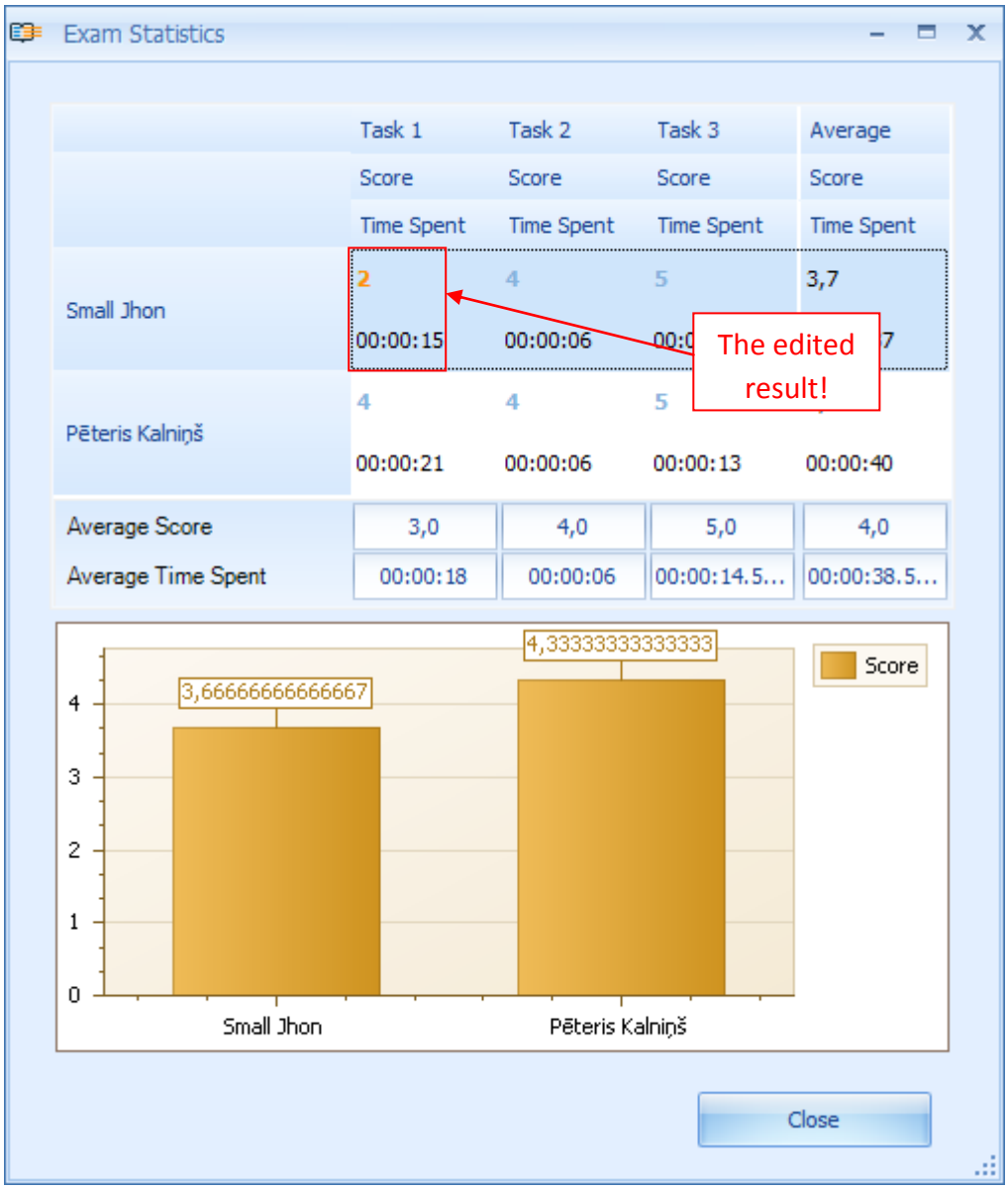
This allows the teacher to overlook the whole task (the question, the solution and the correct answer) as well as the answer provided by the student [1]. The teacher also has access to edit the results [2] and to provide the reason for the correction [3].

If the teacher considers the student's answer partially correct or correct (based on the inserted answer and / or the attached explanation), they can mark up the student's result.

In order to do this the teacher must click the cursor in the result space and manually insert the number of achieved points (it must be limited to 1-10, except when the Educational organization settings determine it otherwise) or insert the correct result by using the result scale:



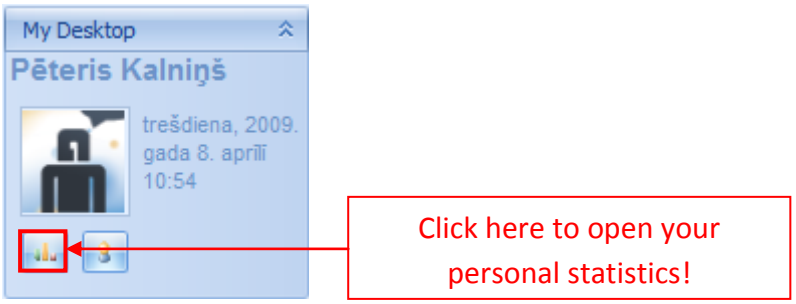
When the teacher has inserted the correct number of points, in order for the system to allow the verification of the corrections, they must also insert the explanations for the performed corrections. After inserting the explanation, the teacher can click on „Correct" to verify the correction. To cancel the corrections click on „Cancel" and the corrections made will not be saved. Sequentially the system will renew the exam statistics and also edit the average indicators:



The students (if they will be allowed to view the exam results) will also have access to the corrections of the results and the reasons for these corrections.

Theme 21: Personal statistics

Each user in the GenExis system is able to see their personal statistics, which are based on obtained results while solving exercises for the training or other purposes. The personal statistics window can be opened from any section of the GenExis system through the user desktop:



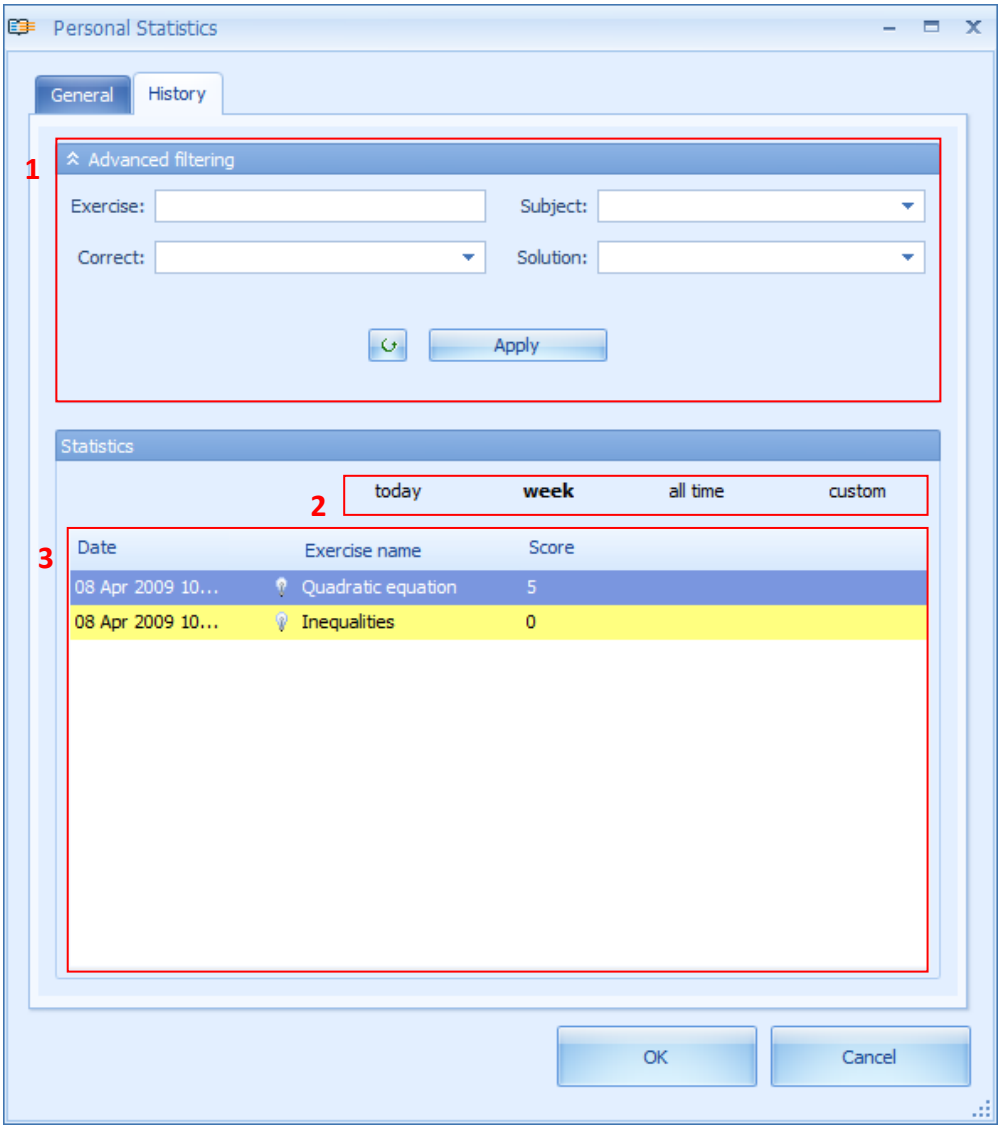
When the personal statistics window is opened, the user is able to find out general information on accomplished exercises and their correctness [1] and the history of completed exercises [2]:

It is possible to filter statistical data for particular subject or topic or particular task by using the filtering tool [3]. It allows the user to check the statistics of their results in a more detailed manner. The data filter is done in a very simple way: the user has to open the menu with a single mouse click and find the corresponding subject, theme or exercise in the offered menu.

The statistical data can be selected not only by the subject or exercise but also by the time [4]. The system offers a convenient way to select the data for today (the day that the user views the statistical data), last week, all time (starting from the user's registration day till this day) or by determining the time period manually (entering the start date and the end date).

The statistical data is formed of information on total amount of accomplished exercises, percentage ratio of correct exercises and the time spent to accomplish exercises [5]. Additionally statistical data is supplemented with graphical visualization [6], displaying the numerical ratio of correct and incorrect answers in a form of a diagram.

In the history section the user is able to view the full version of stored exercises including the user's given answer. Moving on to the history section the list of accomplished exercises [3] and its selection tool [1] is opened.



The history can be filtered according to several parameters: task (by typing its name), subject (by choosing the corresponding subject in the given menu), the correctness of the user's entered answer (by choosing to select only those exercises to which the user has given a correct or incorrect answer), existence of solution (selecting only those exercises with or without solution using the given menu). The historical data can be filtered not only by one parameter but several parameters simultaneously. When the user has set all the desired parameters that needs to be used for data filtering, click „Apply" to perform the action. By clicking on „Refresh" button all the filtering settings will be canceled and the user will be able to view the full history list.
It is possible to select the history statistics by the time [2] in the same way as for general statistics. Namely, the system offers a convenient way to select the data for today (the day that the user views the statistical data), last week, all time (starting from the user's registration day till this day) or by determining the time period manually (entering the start date and the end date).
Note: the history data will be stored in the system history for 14 days unless different time period is set in the Educational organization settings.