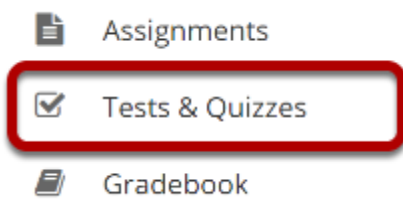


How do I create a calculated question?

This allows for a calculated question to be added to a new or existing assessment. A calculated question calculates new answers for every test, based on variables whose value changes each time. The answer is based on a formula, using those variables.

Go to Tests & Quizzes.



Select the **Tests & Quizzes** tool from the Tool Menu in your site.

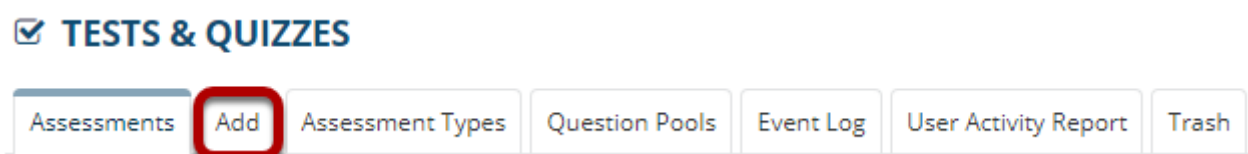
Select an assessment.

Questions may be added to any assessment. Select an existing assessment or create a new one.

Note: You may also [add a question directly to a question pool](#).

Create a New Assessment.

Click Add.



Create from Scratch

Assessment Title **1**

- Create using assessment builder
 Create using markup text

Create **2**

For more information on creating new assessments, see [How do I create an assessment?](#)

Or edit an existing assessment.

Assessment List

View

Display assessments per page

Search:

Title	Status	In Progress	Submitted	For	Open	Due	Last Modified	Modified Date ▾	Remove?
Draft - New Quiz	Draft			Entire Site			Demo Instructor	Apr 10, 2020 6:17 PM	<input type="checkbox"/>
Quiz 1	Published - Active	0	0	Entire Site	Apr 8, 2020 11:55 AM		Demo Instructor	Apr 8, 2020 11:55 AM	<input type="checkbox"/>
Draft - Quiz 1	Draft			Entire Site	Apr 8, 2020 11:55 AM		Demo Instructor	Apr 8, 2020 11:55 AM	<input type="checkbox"/>

Select Calculated Question from drop-down menu.

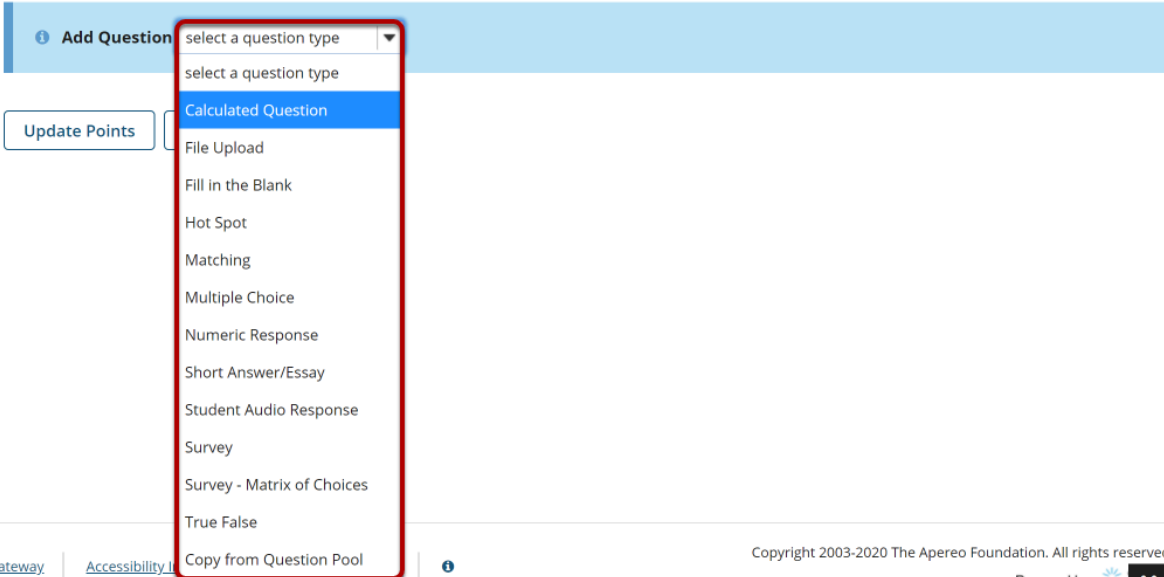
Questions: New Quiz

0 Existing Questions - 0 total points

[Add Part](#) | [Preview](#) | [Print](#) | [Settings](#)

Part 1 ▾ Default - 0 questions

[Copy to Pool](#) | [Edit](#)



The screenshot shows the 'Add Question' interface. A dropdown menu is open, displaying various question types. The 'Calculated Question' option is highlighted in blue. Other options include File Upload, Fill in the Blank, Hot Spot, Matching, Multiple Choice, Numeric Response, Short Answer/Essay, Student Audio Response, Survey, Survey - Matrix of Choices, and True False. The 'Update Points' button is visible to the left of the dropdown menu.

After selecting Calculated Question from the drop-down menu, the program will open options for the question.

Set the point value for the question.

Answer Point Value

1.0

Enter the point value for this question. Questions may be worth any point value you choose.

Tip: Keep in mind that the point value of all the questions in the assessment will equal the point value of the assessment in the Gradebook. So if you want your assessment to be worth a total of 100 points, you should assign point values to your questions accordingly.

Display points?

Display Point Value while student is taking the exam

Yes No

If you want students to see the point value as they are taking the test, leave the default setting of **Yes**. If you prefer that students do not see the point value for the question, select **No**.

Extra Credit. (Optional)

Extra Credit

Selecting this option lets you mark a question as extra credit. This means that the points awarded for this question are not counted as part of the "total points" for the assessment and there are no points deducted for skipping this question or answering incorrectly. However, users answering correctly will receive the question point value added on top of their total points earned in the assessment.

Add Question Text.

Question Text

A calculated question calculates new answers for every test, based on variables whose value changes each time. The answer is based on a formula, using those variables.

Instructions

1. Define variables in the question text by surrounding the variable name with single curly braces (e.g. {x} and {y})
When a student views the question, variable placeholders will be replaced with the variable values
2. Define formula placeholders in the question text by surrounding the formula name with double curly braces (e.g. {{z}})
When the student views the question, formula placeholders will be replaced with input boxes
Internal calculations using the variables can be added using double square brackets [[]]. The calculation result will be shown in the question text (e. g. $[[{x}+{y}]]$).
3. After writing the question text, press the button to Extract Variables and Formulas and Calculations
 - a. Set the min and max values for the variables
 - b. Define formula expressions in terms of the variables, using single curly braces (e.g. {x} - {y})

Example

Kevin has {x} apples. He buys {y} more. Now Kevin has $[[{x}+{y}]]$. Jane eats {z} apples. Kevin now has {{w}} apples.

The formula w in the example above would be defined as: ${x} + {y} - {z}$

▶ [Show/Hide more instructions and examples](#)

Show Rich-Text Editor (and character count)

Solve: $\text{COS}(\{a\}) * (\{c\} - \{b\}) = \{z\}$

Type the **Question Text** into the text box provided. This is the information that the student will see, including the variable and formula placeholders (see examples below).

Variables: Define variables to use in this question below. Reference them in the question text by putting them in single curly braces (e.g., {x}). Variable names are alpha-numeric but must begin with an alpha character.

Example: Kevin has {x} apples. Jane eats {y}. How many does Kevin have now? {{z}}

Formulas: Place double curly braces (e.g., $\{\{y\}\}$) around a formula name to define where the student's input box will display. Formula names are alpha-numeric but must begin with an alpha character.

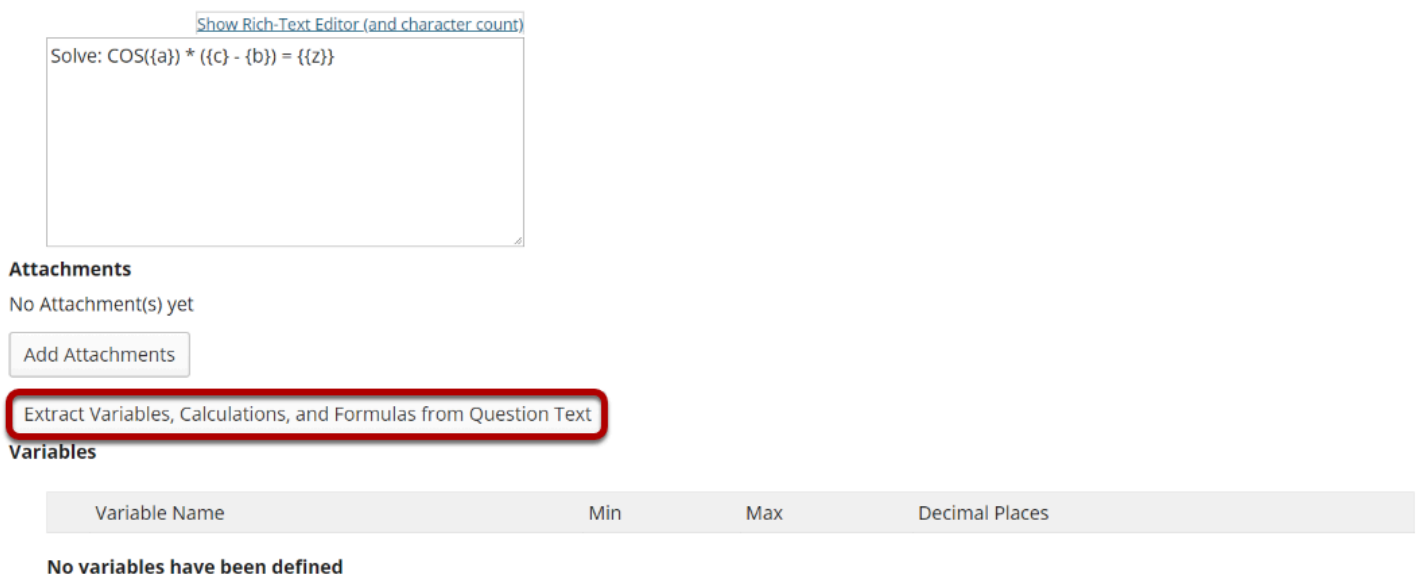
Example: Solve: $\text{COS}(\{a\}) * (\{c\} - \{b\}) = \{\{z\}\}$ Formula z would be $\text{COS}(\{a\}) * (\{c\} - \{b\})$

Keep in mind the following:

- You may define acceptable tolerance as a constant (0.01) or percentage (1.5%) of the answer. (Defaults to 0.01.)
- Variables and formulas support decimals. Default is 3.
- Valid Operators: + - * / ^ ! # ()
- You can use the following math functions: SIN, COS, TAN, ASIN, ACOS, ATAN, ABS, EXP, SGN, SQRT, LOG10, and LN.
- There are two built-in constants, PI(3.14...) and e(2.718...). Use them in your answer expression.
- Variables and Formulas cannot have the same name.
- See <http://mathparser.org/mxparser-math-collection/> for the full set of valid math functions and operators.

Note: To edit with [Rich Text Editor](#), click the hyperlink to open the full menu.

Click Extract Variables, Calculations, and Formulas.



The screenshot shows a question editor interface. At the top, there is a link "Show Rich-Text Editor (and character count)". Below it is a text area containing the formula "Solve: COS({a}) * ({c} - {b}) = {{z}}". Underneath the text area is an "Attachments" section with the text "No Attachment(s) yet" and a button "Add Attachments". A red box highlights a button labeled "Extract Variables, Calculations, and Formulas from Question Text". Below this button is a "Variables" section with a table header:

Variable Name	Min	Max	Decimal Places
No variables have been defined			

Click the **Extract Variables, Calculations, and Formulas from Question Text** button to create the variables and formulas.

Define ranges of variable values.

Variables

Variable Name	Min	Max	Decimal Places
a	<input type="text" value="1"/>	<input type="text" value="5"/>	3 ▼
b	<input type="text" value="8"/>	<input type="text" value="10"/>	3 ▼
c	<input type="text" value="2"/>	<input type="text" value="4"/>	3 ▼

Change the Min, Max, and Decimal Places for all of the variables to define their ranges of valid values.

Enter the formula.

Formulas

Define formula expressions in terms of the variables, using single curly braces (e.g. {x} - {y})

Valid operators: + - * / ^ ()

You can use the following math functions: SIN, COS, TAN, ASIN, ACOS, ATAN, ABS, EXP, SGN, SQRT, LOG10, and LN.

There are two built-in constants, PI(3.14...) and e(2.718...). Use them in your formula expression.

Formula Name	Formula	Tolerance	Decimal Places
z	<input type="text" value="COS({a}) * ((c) - {b}) = {{z}}"/>	<input type="text" value="0.01"/>	3 ▼

Enter the mathematical expression for each Formula, inserting the Variables where needed.

Add attachment. (Optional)

Attachments

No Attachment(s) yet



Click **Add Attachments** to browse for and select a file attachment if desired.

Assign to part. (Optional)

Assign to Part

Part 1 - Default ▼

If you have multiple parts in your assessment, you may assign the question to a different part.

Assign to pool. (Optional)

Assign to Question Pool

Select a pool name (optional) ▼

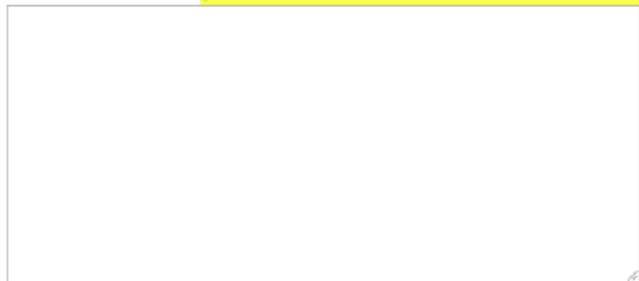
If you have an existing question pool and would like to copy this question to the pool, select the pool name here.

Add feedback for correct answer and/or incorrect answer. (Optional)

Correct/Incorrect Answer Feedback

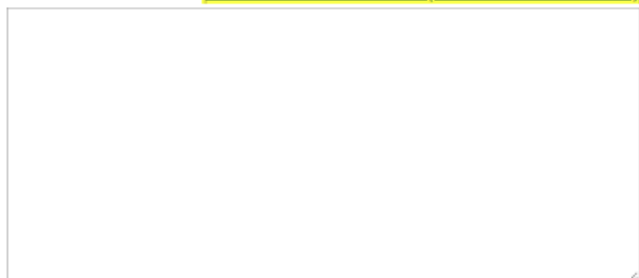
Correct Answer Feedback (optional)

Show Rich-Text Editor (and character count)

A large, empty rectangular box with a thin border, intended for entering feedback for a correct answer. A small cursor icon is visible in the bottom right corner.

Incorrect Answer Feedback (optional)

Show Rich-Text Editor (and character count)

A large, empty rectangular box with a thin border, intended for entering feedback for an incorrect answer. A small cursor icon is visible in the bottom right corner.

Feedback is optional text available for the student to review after the particular question is graded. For numeric response questions, the feedback option is offered for correct and/or incorrect answers, if desired.

Note: To edit with the Rich Text Editor, click the hyperlink to open the full menu.

Click Save.



Click **Save** to save the question (or **Cancel** to exit).