

## Calculated Questions

A calculated question requires students to apply a mathematical formula to answer the question. Calculated questions are designed using variables. Random values, based on a specified range, are automatically generated for each variable in the question. Calculated questions are unique for each student.

**Question:** If a car is traveling [x] miles per hour for [y] hours, how far does it travel, in miles?

**Answer:** Depending on the range you specify, values are inserted for [x] and [y]. Students calculate the answer and enter it in the *Answer* text box.

### Create Calculated Question

#### Question

\*Title:

- Give the question a **title** so that you can distinguish it once it is in your question database. This **Title** will be visible to students unless you change the default in Assessment Settings.

To indicate a variable, enter the variable name as specified in the formula in square brackets  
Example: What is the sum of [x] and [y]?

HTML Creator:  On /  Off

Question text:

Use HTML | Insert equation:

Image:

- Enter your **Question text**. To indicate a variable, enter the variable name as specified in the formula in square brackets.

Example: What is the sum of [x] and [y]?

- You may insert an **image** for this question by clicking **Browse**.

### Settings

Formula:  Enclose variables in square brackets. Example: [x] + [y]. Values for variables will be inserted when the answer set is generated. You can also use constants in place of variables.  
[View a list of supported formulas.](#)

Units:   Required  Ignore spaces  Ignore case

Percentage of the question value:

- Enter the **formula**. Enclose variables in square brackets.

Example: [x] + [y].

Values for variables will be inserted when the answer set is generated. You can also use constants in place of variables.

In the **Units** text box, enter the units for the answer value. Specify the settings for the units:

- To make entering the units a requirement, select **Required**.
- To recognize multi-word units as one word, select **Ignore spaces**.
  - Example: Kilowatt hours and kilowatthours are both correct.
- To recognize units in both upper and lower case, select **Ignore case**.
  - Example: Mile and mile are both correct.

From the **Percentage of the question value** dropdown list, select the percentage that you want to assign to the units. The combined percentage value of the units and the answer will equal 100% of the question value.

Example: When 30 is selected from the Percentage of the question value dropdown list, Students who enter the correct answer, but the wrong units, will only receive 70% of the question value.

- Click **Analyze Variables**. The screen updates and the **Variables** text boxes appear, in addition to the **Answers** section.

Units:	<input type="text"/>	<input type="checkbox"/> Required	<input type="checkbox"/> Ignore spaces	<input type="checkbox"/> Ignore case
	Percentage of the question value: <input type="text" value="0"/>			
Variables:	<b>X</b> Minimum: <input type="text"/>	Maximum: <input type="text"/>	Calculate to <input type="text" value="0"/>	decimal places
	<b>Y</b> Minimum: <input type="text"/>	Maximum: <input type="text"/>	Calculate to <input type="text" value="0"/>	decimal places
<b>Answers</b>				
Answer Set:	Specify the number of answers per set <input type="text" value="10"/>			
	Calculate the answer sets to <input type="text" value="0"/>	<input type="text" value="Decimal"/>		
	Answer Tolerance (+/-): <input type="text"/>	<input type="radio"/> Units:	<input checked="" type="radio"/> Percent	
<input type="button" value="Generate Answer Set"/> <input type="button" value="Cancel"/>				

For each variable that you entered in the question text, do the following:

- In the **Minimum** and **Maximum** text boxes, enter the minimum and maximum values for that variable. Vista generates values for the variable between these two numbers.
- From the **Calculate to** dropdown lists, select the number of decimal places to which you want the answer to be calculated.

Complete the **Answers** section.

- From the **Specify the number of answers per set** dropdown list, select the number of answers you want per answer set.
- From the **Calculate the answer sets to** dropdown lists, select the number of either decimal places or significant figures to which you want the answer sets to be calculated.

You can create a tolerance for the answer, so that students' answers in the plus or minus range between the tolerance and the calculated answer will still be considered correct.

- In the **Answer Tolerance (+/-)** text box, enter the tolerance value. Select whether the answer tolerance value is in Units or Percent.

## Answers

Answer Set:

Specify the number of answers per set

Calculate the answer sets to

Answer Tolerance (+/-):   Units:  Percent

	<b>x</b>	<b>y</b>	<b>Answer</b>
1	<input type="text" value="2.3"/>	<input type="text" value="4.1"/>	6
2	<input type="text" value="2.3"/>	<input type="text" value="2.9"/>	5
3	<input type="text" value="4.2"/>	<input type="text" value="4.7"/>	9
4	<input type="text" value="3.9"/>	<input type="text" value="4.4"/>	8
5	<input type="text" value="3.3"/>	<input type="text" value="5.4"/>	9
6	<input type="text" value="4.6"/>	<input type="text" value="2.1"/>	7
7	<input type="text" value="2.5"/>	<input type="text" value="3.7"/>	6
8	<input type="text" value="3.3"/>	<input type="text" value="4.8"/>	8
9	<input type="text" value="3.6"/>	<input type="text" value="3.1"/>	7
10	<input type="text" value="1.8"/>	<input type="text" value="2.9"/>	5

- Click **Generate Answer Set**. The screen updates and the answer set appears.
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