Creating a Calculated Formula Question

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A calculated formula question contains a formula, the variables of which are set to change for each user. The variable range is created by specifying a minimum value and a maximum value for each variable. Answer sets are randomly generated. The correct answer is a specific value or a range of values. Partial credit may be granted for answers falling within a range.

The question is the information presented to students. The formula is the mathematical expression used to find the answer. Remember to enclose variables in square brackets.

1. Open the canvas page for a test, survey, or pool.

2. On the Action Bar, click on **Create Question** and select **Calculated Formula** from the drop-down list.
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3. Type the information that will display to students in the **Question Text** box. Surround any variables with square brackets, for example, \([x]\). The value for this variable will be populated based on the formula. In the example \([x] + [y] = z\), \([x]\) and \([y]\) will be replaced by values when shown to students. Students would be asked to define \(z\). Variables should be composed of alphabetic characters, digits (0-9), periods (.), underscores (_) and hyphens (-). All other occurrences of the opening rectangular brace ("[") character should be preceded by the back-slash (\") character. Variable names must be unique and cannot be reused.

![Question Text]

4. Define the formula used to answer the question in the **Answer Formula** box. For example, \(x + y\). Operations are chosen from the buttons across the top of the Answer Formula box.

![Answer Formula]
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5. Set the Answer Range. This defines which submitted answers will be marked correct. If the exact value must be entered, enter 0 and select Numeric from the drop-down list. If the answer can vary, enter a value and select Numeric or Percent. Numeric will mark every answer as correct that falls within a range of plus or minus the Answer Range from the exact answer. Percent will mark every answer as correct that falls within a percentage of plus or minus the Answer Range from the exact answer.

2. **Options**

   Define the correct answer range, plus or minus a numeric or a percentage variation from the exact answer. If the correct answer must be exact, the range should be 0. If partial credit is allowed, define the broader range for partial credit and the percentage of the total points that will be given if the answer is within the partial credit range. Units can be required as part of the answer, and optionally a percentage of the total points can be deducted from the points given if the units are incorrect.

   - **Answer Range +/-**
     - 0
     - Numeric: ☑
   - Allow Partial Credit: ☐
   - Units Required: ☐

6. Click the **Allow Partial Credit** check box to allow partial credit for answers that fall outside the correct Answer Range.

7. Set the range for partial credit by entering a value and selecting Numeric or Percent for the Partial Credit Range. Answers falling within this range will receive a portion of the total points possible for the question equal to the Partial Credit Points Percentage.

8. Type a value for the Partial Credit Points Percentage.

9. Click the **Units Required** check box to require that correct answers must include the correct unit of measurement, for example, seconds, meters, or grams.

10. Type the correct unit of measurement in the Answer Units field.

11. Click the **Units Case Sensitive** check box to require that correct answers are case sensitive. The answer may still receive partial credit if the unit of measurement is not correct.

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12. Type a percentage in Unit Points Percentage. The unit of measurement will account for that percentage of the total credit.

13. When finished with the question, click **Next** to proceed.

The next page in the three step process defines the variables in the formula.

1. Type a Minimum Value and a Maximum Value for each variable.

2. Select a decimal place using the Decimal Places drop-down list.

3. Under Answer Set Options, select the Decimal Places for Answer from the drop-down list. Students must provide the correct answer to this decimal place.

4. Type the Number of Answer Sets. The answer sets will be randomized so that different students will be presented with a different set of variables.
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5. Click **Calculate** to reset the variables after making a change or click **Go Back** to return to the previous page.

The last step in the process displays the answer sets in a table. Advanced features for questions, such as Feedback and Categories and Keywords are defined by the creation settings for the test.

1. Edit or remove any unwanted answer sets and click **Calculate**.

2. Type the Correct Response Feedback that appears in response to a correct answer and the Incorrect Response Feedback for an incorrect answer. If partial credit is allowed, answers that are partially correct will receive the feedback for an incorrect answer.

3. Add Question Metadata in the Categories and Keywords section.

4. Click **Submit** to add the question to the test.
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Having trouble following the instructions in this PDF? Contact the IT Service Center via Live Chat or by phone at 859-572-6911.