

Sample Q1: Download the xml file and follow along the screenshots to learn how to create a basic formula question in Moodle. This type of question would be helpful when you want to randomise one variable to increase test security or allow students to practice the quiz question multiple times.

General

Current category: Lonie Mathematics Questions Formulas (38) Use this category

Save in category: Lonie Mathematics Questions Formulas (38)

Question name: Moodle formula Qs - sample Q1

Variables

Random variables: $a = \{1:100:5\}$

Global variables: $b = 10;$
 $c = a + b$

Main question

Question text: Answer the following question:

Give your question a name here.
It will appear in the question bank under this name. Students will not see the question name, so aim to name each question something that will help you identify it easily when making a quiz.

Add random variables.
Here, we have added a random variable called 'a' which will be randomly assigned any number between 1 and 100, in increments of 5.

Add global variables.
Here, we have added a variable called 'b' which is always equal to 10 and a variable 'c' to represent the correct answer, which uses our existing variables a and b.

Write a general question instruction.
Place a generic message here relating to your whole question, you can give specific instructions below in the parts section.

Part 1

Part's mark*: 1

Answer type: Number

Answer*: [c]

Grading criterion*: Absolute error < 0.01

Unit:

Placeholder name:

Part's text: Given that $a = \{a\}$ and $b = \{b\}$, what is $a + b$?
{_0}

Place the correct answer here.
Place your answer here in square brackets. Since we have defined the answer as a variable earlier, we can refer to it here.

Define the amount of error allowed.
Here, we have allowed for an absolute error of 0.01. In other words, any answer +/- 0.01 of the correct answer will be marked correct.
You can also use relative error in a similar way. However, 0.01 relative error will represent that the answer can be within 10% of the correct answer.

Write the question and define a space for the student answer.
Write your question here, referring to the variables you created earlier using the curly brackets. When students view the question, {a} and {b} will be replaced with the values you assigned them earlier. {_0} will create a box where the student can write the answer. Remember that answer operators start at 0, not 1.

Blanks for 2 more parts

Check variables instantiation

Combined feedback

Multiple tries

Tags

Created / last saved

Save changes and continue editing Preview

Save changes Cancel

Save changes.
For a basic question, you don't need to change any other settings. Press Save changes to save your question. If there are any sections which are not formatted correctly, you will get an error message—go back and check that you have added everything in the correct format. Remember that a space or comma in the incorrect position can cause an error. Refer back to our instruction document for help.

Question 1
Not complete
Marked out of 1.00

Answer the following question:
Given that $a = 56$ and $b = 10$, what is $a + b$?

Check

Start again Save Fill in correct responses Submit and finish Close preview

Technical information

If you preview your question, it should look like this. Each time you 'start again', you will notice that the random variable 'a' is randomly assigned a different value.
You can now test student answers and see how your question will react to different answers.

Sample Q2: We will build on the previous question and learn how to add multiple variables and multiples questions/answers within one part. This type of question can be applied when you have a slightly more complex question and want to randomise multiple variables.

Question name: Moodle formula Qs - sample Q2

Variables

Random variables: $a = \{1:100:5\}; b = \{50:200:2\}$

Global variables: $c = 10; d = a + b; e = b + c; f = d + e$

Main question

Question text: Answer the following question:

Add random variables.
Here, we have added a random variable called 'a' which will be randomly assigned any number between 1 and 100, in increments of 5 and a another random variable called 'b' which will be randomly assigned any number between 50 and 200, in increments of 2. The variables are separated by a semi-colon.

Add global variables.
Here, we have added a variable called 'c' which is always equal to 10 and variables 'd, e and f' to represent the correct answers, which uses our existing variables.

Part 1

Part's mark*: 1

Answer type: Number

Answer*: [d, e, f]

Grading criterion*: Absolute error < 0.01

Unit:

Placeholder name:

Part's text: Given that $a = \{a\}$, $b = \{b\}$ and $c = \{c\}$:
 $d = a + b$
 $e = b + c$
 Calculate d: { _0 }
 Calculate e: { _1 }
 What is d + e? { _2 }

Place the correct answers here.
Place your answers here in square brackets, in order, separated by commas. Since we have defined the answers as variables earlier, we can refer to them here.

NOTE: Now that you have multiple answers within one part, if you use relative error then the % of allowable error will be calculated based on the largest value and applied to all answers. To avoid this, use separate parts for each answer.

Write the question and define a space for the student answers.
Write your question here, referring to the variables you created earlier using the curly brackets. When students view the question, {a}, {b} and {c} will be replaced with the values you assigned them earlier. { _0 }, { _1 } and { _2 } will create a box each where the student can write the answers. The order you place them here should correspond with the order you named them in the answer box.

Blanks for 2 more parts

Question 1
Not complete
Marked out of 1.00

Answer the following question:
Given that $a = 1$, $b = 196$ and $c = 10$:
 $d = a + b$
 $e = b + c$
 Calculate d:
 Calculate e:
 What is d + e?

Check

Start again Save Fill in correct responses Submit and finish Close preview

Technical information
Behaviour being used: Adaptive mode (multi-part questions)
Minimum fraction: 0
Maximum fraction: 1

If you preview your question, it should look like this. Students will need to input an answer in each of the boxes. Each time you 'start again', you will notice that the random variables 'a', 'b' and 'c' are randomly assigned a different value.

You can now test student answers and see how your question will react to different answers.

Sample Q3: We will now use those same random variables to introduce you to applying rounding to the answer. You can apply this type of question when your question specifies that the answer should be rounded to a certain number of decimal places or significant figures.

Question name: Moodle formula Qs - sample Q3

Variables

Random variables: $a = \{1:100:5\}; b = \{50:200:2\}$

Global variables: $c = (b - 3)/a$

Main question

Question text: Answer the following question:

Add random variables.
Let's use the same random variables in this example too.

Add global variables.
Here, we have added a variable called 'c' to represent the correct answer, which uses our existing variables.

Part 1

Part's mark*: 1

Answer type: Number

Answer*: $\text{round}(c, 2)$

Grading criterion*: Absolute error < 0.01

Unit:

Placeholder name:

Part's text: Given that $a = \{a\}$ and $b = \{b\}$:
 $c = (b - 3)/a$
Calculate c: { _ }0

Place the correct answer here.
Here, we will use the round function to define how many decimal places will be marked as correct. It is used in the format $\text{round}(c,2)$ where 'c' is the answer and 2 is the number of decimal places the answer should be rounded to. The signif function can be used in a similar way but with the number of significant figures instead. Refer to the instruction document for a table of functions which can be used in Moodle.

Blanks for 2 more parts

Question 1
Not complete
Marked out of 1.00

Answer the following question:
Given that $a = 76$ and $b = 138$:
 $c = (b - 3)/a$
Calculate c:

Check

Start again Save Fill in correct responses Submit and finish Close preview

Technical information
Behaviour being used: Adaptive mode (multi-part questions)
Minimum fraction: 0
Maximum fraction: 1

If you preview your question, it should look like this. Each time you 'start again', you will notice that the random variables 'a' and 'b' are randomly assigned a different value.

You can now test student answers and see how your question will react to different answers.

NOTE: The student answer will now be marked incorrect if the incorrect number of decimal places is given.

Sample Q4: We will use the same random variables again to introduce you to adding a unit to your answer and basic unit conversions. You can apply this type of question when the answer requires a unit, particularly when the question relates to 'real-world' or industry specific scenarios.

Question name: Moodle formula Qs - sample Q4

Variables

Random variables: $a = \{1:100:5\};$
 $b = \{50:200:2\}$

Global variables: $c = a + b$

Main question

Question text: Answer the following question:

Add random variables.
Let's use the same random variables in this example too.

Add global variables.
Here, we have added a variable called 'c' to represent the correct answer, which uses our existing variables.

Part 1

Part's mark*: 1

Answer type: Number

Answer*: [c]

Grading criterion*: Absolute error < 0.01

Unit: km

Placeholder name:

Part's text: Given that the trip from town A to town B is {a} km and the trip from town B to town C is {b} km. Calculate the total distance traveled for the two trips. {_0} {_u} Please include the correct unit in the 2nd box, making sure that you use the correct format and case.

Add the correct unit here.
Specify the correct unit for your answer.

Write the question and define a space for the student answers.
Write your question here, referring to the variables you created earlier using the curly brackets. When students view the question, {a} and {b} will be replaced with the values you assigned them earlier. {_0} will create a box each where the student can write the numeric answer and {_u} will create a box where the student can place the appropriate unit. Remember to advise students to include a unit in their answer within the question text and remind them that units are format and case specific.

Blanks for 2 more parts

Extra options

Global - Basic conversion rules: Common SI unit

Select whether basic conversion rules are allowed.
Under the drop down menu 'Extra options', you can choose whether or not to allow basic conversion rules, which will automatically mark the unit correct if the answer is correctly converted to any standard SI unit acknowledged by Moodle. Refer to the instruction document for a list of standard SI units. This function is automatically turned on when you create a new question.

Check variables instantiation

Combined feedback

Multiple tries

Tags

Created / last saved

Question 1
Not complete
Marked out of 1.00

Answer the following question:
Given that the trip from town A to town B is 66 km and the trip from town B to town C is 128 km. Calculate the total distance traveled for the two trips.
[] []
Please include the correct unit in the 2nd box, making sure that you use the correct format and case.

Check

Start again Save Fill in correct responses Submit and finish Close preview

If you preview your question, it should look like this. Each time you 'start again', you will notice that the random variables 'a' and 'b' are randomly assigned a different value.

You can now test student answers and see how your question will react to different answers. Note that the student answer will now be marked incorrect if the incorrect unit is given.

Technical information
Behaviour being used: Adaptive mode (multi-part questions)
Minimum fraction: 0

Sample Q5: We will use the same format as sample Q4 and expand upon using units, in particular, how to apply a non-standard unit conversion rule. This will be helpful when there are industry-specific units which are not included in the standard Moodle unit conversions (listed in the instruction document).

Question name ! Moodle formula Q5 - sample Q5

Variables

Random variables ? `a = {1:100:5};
b = {50:200:2}`

Global variables ? `c = a + b`

Main question

Question text ! ?

Answer the following question:

Let's use the same random and global variables as sample Q4.

Part 1

Part's mark* ? 1

Show less...

Local variables ?

Grading variables ?

Other rules ? 1 km = 0.621371 miles

Add a non-standard unit conversion rule.

Click 'Show more...' to view the additional settings and place the non-standard unit conversion rule in other rule with the format '1 km = 0.621371 miles' which indicates that for the answers of this part, 1km can be converted to 0.621371 miles. Ensure that there is a space between the number and the unit. Refer to the instruction document to check which unit conversions are common/standard in Moodle.

Answer type ? Number

Answer* ? [c]

Grading criterion* ? Absolute error < 0.01

Unit ? km = miles

Placeholder name ?

Part's text ?

Given that the trip from town A to town B is {a} km and the trip from town B to town C is {b} km. Calculate the total distance traveled for the two trips. Convert your answer to miles.

{_O} {_u}

Please include the correct unit in the 2nd box, making sure that you use the correct format and case.

Blanks for 2 more parts

Add the correct units here.

Specify the correct units here. Since we have added a unit conversion, you can specify multiple units by adding an equals sign in between.

Question 1
Answer saved
Mark 1.00 out of 1.00

Answer the following question:
Given that the trip from town A to town B is 71 km and the trip from town B to town C is 110 km. Calculate the total distance traveled for the two trips. Convert your answer to miles.

181 km

Please include the correct unit in the 2nd box, making sure that you use the correct format and case.

Check

If you preview your question, it should look like this. Each time you 'start again', you will notice that the random variables 'a' and 'b' are randomly assigned a different value.

You can now test student answers and see how your question will react to different answers. Note that the student answer will now be marked incorrect if the incorrect unit is given. However, both km and miles will be accepted as correct answers.

Question 1
Answer saved
Mark 1.00 out of 1.00

Answer the following question:
Given that the trip from town A to town B is 71 km and the trip from town B to town C is 110 km. Calculate the total distance traveled for the two trips. Convert your answer to miles.

112.4 mile

Please include the correct unit in the 2nd box, making sure that you use the correct format and case.

Check

NOTE: Since there are now 2 layers of calculations, ensure that you have allowed for some error (absolute or relative) so that the marking is not too harsh.

Sample Q6: We will use the same random and global variables as sample Q2 to introduce you to adaptive marking for composite answers. This will be helpful when you want to assign an uneven proportion of the full mark to questions within the same part.

Question name: Moodle formula Qs - sample Q6

Variables

Random variables: $a = \{1:100:5\}; b = \{50:200:2\}$

Global variables: $c = 10; d = a + b; e = b + c; f = d + e$

Main question

Question text: Answer the following question:

Let's go back and use the random variables and global variables we set up in sample Q2.

Part 1

Part's mark*: 1

Local variables:

Grading variables: $crit1 = _0 == d; crit2 = _1 == e; crit3 = _2 == f$

Other rules:

Add grading variables.
Click 'Show more...' to view the additional settings and add the grading variables as Boolean expressions. Here, we have added a variable called 'crit1' which will be assigned a 1 if the student answer for _0 is equal to variable 'd' (i.e. the student has answered correctly) and a 0 if it is not equal (i.e. the student has answered incorrectly). The same format has been used for 'crit2' and 'crit3'. We will use these variables below in the grading criterion.

Answer type: Number

Answer*: [d, e, f]

Grading criterion*: $(crit1*0.3)+(crit2*0.3)+(crit3*0.4)$ Expert

Unit:

Placeholder name:

Part's text: Given that $a = \{a\}$, $b = \{b\}$ and $c = \{c\}$:
 $d = a + b$
 $e = b + c$
 Calculate d: { _0 }
 Calculate e: { _1 }
 What is d + e? { _2 }

Place the correct answers here.
Answers can be kept in the same format as before.

Specify the grading criterion.
Tick 'Expert' to switch to this mode. Specify how marks will be allocated using the grading criterion. Since this part has been allocated 1 mark, the grading criterion will determine what proportion of that 1 mark the student will be awarded.
 Here, we have specified the mark allocation with the mathematical expression: $(crit1*0.3) + (crit2*0.3) + (crit3*0.4)$
 'crit1', 'crit2' and 'crit3' have been defined in the grading variables. Depending on the student answer, these variables will be assigned a 0 or a 1. Here, we have allocated the first answer allocated 0.3 of the mark, the second 0.3 and the third 0.4.
 e.g. all answers correct -> $(crit1*0.3) + (crit2*0.3) + (crit3*0.4) = (1*0.3) + (1*0.3) + (1*0.4) = 1$
 e.g. last answer incorrect -> $(crit1*0.3) + (crit2*0.3) + (crit3*0.4) = (1*0.3) + (1*0.3) + (0*0.4) = 0.6$

Blanks for 2 more parts

Question 1
Not complete
Mark 0.60 out of 1.00

Answer the following question:
Given that $a = 6$, $b = 96$ and $c = 10$:
 $d = a + b$
 $e = b + c$
 Calculate d: 102
 Calculate e: 106
 What is d + e? 258

Check

Your answer is partially correct.
You have correctly answered 0 part(s) of this question.

If you preview your question, it should look like this. Each time you 'start again', you will notice that the random variables 'a' and 'b' are randomly assigned a different value. In this example, the student has answered the first 2 questions correctly and the last question incorrectly so they have received 60% of the full mark.

You can now test student answers and see how your question will react to different answers.

NOTE: As the question setup gets more complex, it will become more important to test the question and test using both reasonable and unreasonable answers.

Sample Q7: We will use the same format as sample Q6 and expand upon using adaptive marking. This will be helpful when you have set up an answer which relies on other answer previously calculated by the student.

Question name: Moodle formula Qs - sample Q7

Variables

Random variables: $a = \{1:100:5\}; b = \{50:200:2\}$

Global variables: $c = 10; d = a + b; e = b + c; f = d + e$

Main question

Question text: Answer the following question:

Let's use the same random and global variables as sample Q6.

Part 1

Part's mark*: 1

Local variables:

Grading variables: $crit1 = _0 == d; crit2 = _1 == e; crit3 = _2 == f; crit4 = _2 == (_0 + _1)$

Add grading variables.
Click 'Show more...' to view the additional settings and add the grading variables as Boolean expressions. We have kept 'crit1', 'crit2' and 'crit3' the same as sample Q6. However, we have added a variable called 'crit4' which will be assigned a 1 if the student answer for $_2$ is equal to the sum of answers $_0$ and $_1$ (i.e. the student has answered correctly based on the answers they gave for the first two questions) and a 0 if it is not equal (i.e. the student has answered incorrectly). We will use these variables below in the grading criterion.

Answer type: Number

Answer*: [d, e, f]

Grading criterion*: $max((crit1*0.3 + crit2*0.3 + crit3*0.4), (crit1*0.3 + crit2*0.3 + crit4*0.2))$ Expert

Unit:

Placeholder name:

Part's text: Given that $a = \{a\}$, $b = \{b\}$ and $c = \{c\}$:
 $d = a + b$
 $e = b + c$
 Calculate d: { _0 }
 Calculate e: { _1 }
 What is d + e? { _2 }

Place the correct answers here.
Answers can be kept in the same format as before.

Specify the grading criterion.
Here, we have specified the mark allocation with the mathematical expression: $max((crit1*0.3 + crit2*0.3 + crit3*0.4), (crit1*0.3 + crit2*0.3 + crit4*0.2))$
 The max () function means that between the 2 strings, separated by a comma, the one which returns a larger value will be used. The first string will assign the first answer 0.3 of the mark, the second 0.3 and the third 0.4; while the second string will assign the last answer 0.2 instead of 0.4 for the last answer if the student has answered one/both of the first 2 answers incorrectly but has then used it to correctly answer the last question.
e.g. first 2 incorrect but last is correct based on the answers given for the other two questions ->
 $(crit1*0.3) + (crit2*0.3) + (crit3*0.4) = (0*0.3) + (0*0.3) + (0*0.4) = 0$
 $(crit1*0.3) + (crit2*0.3) + (crit4*0.2) = (0*0.3) + (0*0.3) + (1*0.2) = 0.2$
 Therefore, the max = 0.2 and 20% of the full mark is awarded.

Blanks for 2 more parts

Question 1
Not complete
Mark 0.20 out of 1.00

Answer the following question:
Given that $a = 61$, $b = 158$ and $c = 10$:
 $d = a + b$
 $e = b + c$
 Calculate d: 215
 Calculate e: 160
 What is d + e? 375

Your answer is partially correct.
You have correctly answered 0 part(s) of this question.

If you preview your question, it should look like this. Each time you 'start again', you will notice that the random variables 'a' and 'b' are randomly assigned a different value. In this example, the student has answered the first 2 questions incorrectly, but the last question is correct based on the previous 2 answers, so they have received 20% of the full mark.
You can now test student answers and see how your question will react to different answers.

NOTE: Try to break up the question as much as possible and stick to answers that are only dependant on one previous answer.

Sample Q8: We will use the same format as sample Q7 and expand upon using adaptive marking, in particular, using absolute and relative error in conjunction with adaptive marking. Be aware that absolute and relative error used in this way is very unstable on Moodle, so it should be used with caution.

Question name: Moodle formula Qs - sample Q8

Variables

Random variables: `a = {1:100:5};
b = {50:200:2}`

Global variables: `c = 10;
d = a + b;
e = b + c;
f = d + e`

Main question

Question text: Answer the following question:

Let's use the same random and global variables as sample Q7.

Part 1

Part's mark*: 1

Local variables:

Grading variables: `crit1 = _0 == d;
crit2 = _1 == e;
crit3 = _2 == f;
crit4 = _2 == (_0 + _1)`

We will also use the same grading variables as sample Q7.

Answer*: [d, e, f]

Grading criterion*: $\max((_relerr < 0.01) * crit1 * 0.3 + crit2 * 0.3 + crit3 * 0.4), ((_relerr < 0.01) * crit1 * 0.3 + crit2 * 0.3 + crit4 * 0.2)$ Expert

Unit:

Placeholder name:

Part's text: Given that a = {a}, b = {b} and c = {c}:
d = a + b
e = b + c
Calculate d: { _0 }
Calculate e: { _1 }

Blanks for 2 more parts

Specify the grading criterion.

Here, we have specified the mark allocation with the mathematical expression:
 $\max((_relerr < 0.01) * crit1 * 0.3 + crit2 * 0.3 + crit3 * 0.4), ((_relerr < 0.01) * crit1 * 0.3 + crit2 * 0.3 + crit4 * 0.2)$

We have added a Boolean operator (`_relerr < 0.01`) to each string which will be assigned a 1 if the student answers are within 10% of the expected answers (i.e. within the error tolerance) and a 0 if the student answers are outside the error tolerance.

You can do the same with absolute error by using the Boolean operator (`_err < 0.01`) instead.

Question 1: Not complete, Marked out of 1.00

Answer the following question:
Given that a = 31, b = 156 and c = 10:
d = a + b
e = b + c
Calculate d:
Calculate e:
What is d + e?

Check

Start again Save Fill in correct responses Submit and finish Close preview

Technical information: Behaviour being used: Adaptive mode (multi-part questions), Minimum fraction: 0

If you preview your question, it should look like this. It will look like and be marked in the same way as sample Q7, but now with an error tolerance of 10% (relative to the answer with the largest value). You can now test student answers and see how your question will react to different answers.

NOTE: Using both adaptive marking and error in the grading criterion can make the question act very unpredictably. It may seem like it is working correctly when testing reasonable answers, however it may also mark unreasonably large/small answers correct. Please use this function with caution and test using both reasonable and unreasonable answers.