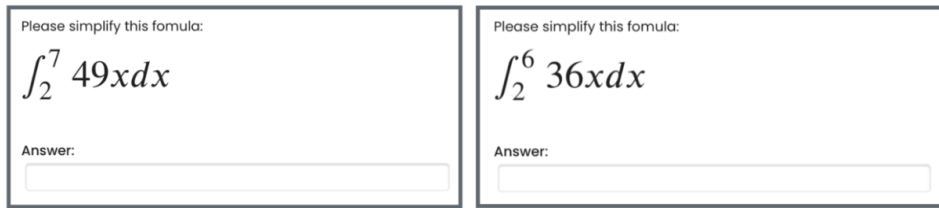


# STACK question type



An example of STACK question type

## Overview:

This guide will show you how to create a STACK question type.

## What to know:

The features of STACK question type are listed below.

1. It supports random variables into the questions. (As can be seen from the example above, one student sees the question as the first picture, while another student sees the question as the second picture. It is this question uses random variables.)
2. It supports variables defined by other expressions.
3. It supports variables with pre-defined values.
4. It supports answer tolerance and the use of units.

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### Step 1: Access the Quiz activity where you want to create the question

In your module area/course, click the link of the Quiz activity where you want to create a question.

## ▼ Topic 5



Example Quiz

Receive a grade

**Opened:** Wednesday, 8 November 2023, 1:31 PM

Note: If an appropriate Quiz activity doesn't exist in your module area/course, please see [Add a quiz](#) for details of how to create one.

### Step 2: Open the 'Questions' tab.

1. Open the 'Questions' tab.

The screenshot shows the 'Example Quiz' interface. At the top left is a pink square icon with a white checkmark. To its right is the title 'Example Quiz'. Below the title is a navigation menu with five items: 'Quiz', 'Settings', 'Questions', 'Results', and 'Question bank', followed by a 'More' dropdown arrow. The 'Questions' item is highlighted with a red rectangular box. Below the navigation menu is a 'Receive a grade' button. Underneath that is the text 'Opened: Wednesday, 8 November 2023, 1:31 PM'. At the bottom left is a blue 'Preview quiz' button. At the bottom right is the text 'Attempts allowed: 1'.

### Step 3: Add a new question

1. On the following page, click the 'Add' link.
2. Click the 'a new question' link in the dropdown menu.

# Example Quiz

Quiz Settings Questions Results Question bank More ▾

## Questions

Questions: 1 | This quiz is open

Maximum grade  Save

Repaginate Select multiple items Total of marks: 1.00

Page 1

Shuffle ?

1    The Loch Ness Monster is a type of? The Loch Ness Monster ... Always

- + a new question
- + from question bank
- + a random question

### Step 4: Choose a question type

1. Locate and select the STACK question type from the pop-up window.
2. Click the 'Add' button.

#### Choose a question type to add


$\frac{2+2}{=7}$  Calculated simple


$\frac{2+2}{=7}$  Calculated multichoice


$x^2$  Variable numeric

$\{1,2\}$  Variable numeric set


$\{0\}m$  Variable numeric set with units

 STACK

 VPL Question

 CodeRunner


OTHER

 Description

STACK provides mathematical questions for the Moodle quiz. These use a computer algebra system to establish the mathematical properties of the student's responses.

### Step 5: Give a question name

Give a question name in the 'Question name' setting.

Question name 


Variable numeric

## Step 6: Set up variables

Give a question name in the 'Question variables' setting.

Hints:

1. Random variables can be defined by `rand(n)`. Then the random values will be generated from 0 to n. If you want the random values to start from 1, then write `rand(n)+1`.
2. It also supports the variables to be defined by other variables.

Question variables 

```
a1: 1+rand(6);  
a2: 1+rand(7);  
a3: 2+rand(3);  
exp: a1*(x-a2)^(-a3);  
ta: int(exp, x)+c;  
ta2: int(exp, x);
```

## Step 7: Write the question text

Type in the question in the 'Question text' box, such as the example in the screenshot below.

The special Mathematical formulas and symbols can be written in Latex/Tex. You either edit the formula in Latex editors or click the icon on the top left of the text box and click the icon highlighted icons in the screenshot to edit the Latex formula.

Hint:

1. The random variables, such as variable `exp`, need to be covered with '@' and '@' so that the system knows it is a variable.
2. The whole formula is written by Latex.
3. '`[[input:ans1]] [[validation:ans1]]`' is a default text in this area. Please do not delete it. It means the input correct answer is named as 'ans1'.

Question text  

Find the intergrations of  $\int \int_{@exp@} \mathrm{d}x$

`[[input:ans1]] [[validation:ans1]]`

## Step 8: Set up the full mark and general feedback (optional)

If you do not need to change the full mark and give general feedback, you can skip this step.

1. Under the 'Default mark', you can change the full mark of this question from 1 mark to another mark.
2. Under the 'General feedback', you can add feedback that every student will see.

The screenshot shows a configuration panel for a question. At the top, there is a 'Default mark' section with a warning icon and a text input field containing the number '10'. Below this is a 'General feedback' section with a help icon and a rich text editor. The rich text editor has a toolbar with icons for text color, background color, bold, italic, underline, bulleted list, numbered list, link, and unlink. The text in the editor reads: 'This question checks the use of knowledge related to . You can check the Lecture 10.'

### Step 9: 'Input: ans1' section

The section 'input:ans1' defines the input answer.

This question type supports plenty of input types in 'input type'.

The screenshot shows a configuration panel with a list of settings on the left and a dropdown menu on the right. The settings listed are: 'Input type', 'Model answer', 'Input box size', 'Insert stars', and 'Syntax hint', each with a help icon. The dropdown menu is open, showing a list of input types: 'Algebraic input' (selected with a checkmark), 'Checkbox', 'Drop down list', 'Equivalence reasoning', 'Matrix', 'Matrix of variable size', 'Notes', 'Numerical', 'Radio', 'Single character', 'String', 'Text area', 'True/False', and 'Units'.

Then, define the correct answer in 'model answer'. You can write down the correct answer here. If the correct answer is complex, you can use the correct answer by a variable, such as 'ta', as shown below. Then define the variable 'ta' in the 'Question variables' setting in Step 6.

The screenshot shows a configuration panel with a 'Model answer' label and a help icon, followed by a text input field containing the variable 'ta'.

### Step 10: 'Potential response tree' section

STACK question type allows teachers to define a potential response tree to check partially correct answers and give marks and feedbacks accordingly automatically.

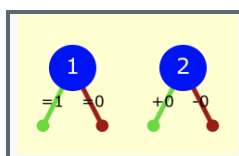
By default, there is only one node in the response tree. It is to define whether the student input answer is right or not.

1. In 'SAns' (student answer) setting, please define the student answer by writing down 'ans1'. This is the default student input, as described in Step 7 (Hint 3).
2. In 'TAns' (teacher answer) setting, please define the correct answer. It is the same with the answer defined in 'model answer' in Step 9.
3. Then, please define the score. The green area is to define the score of the correct answer. So the 'score' is '1' and the penalty is '0'. Feedback can also be given in the feedback area below.
4. Then, the red area is to define the score of the wrong answer. The 'score' can be '0', etc.

The screenshot shows the configuration for a single node in a question editor. At the top, a small tree diagram shows a root node with a score of 1 and a penalty of 0. Below this, the configuration for 'Node 1' is shown in a purple background. The 'Answer test' is set to 'AlgEquiv', 'SAns' is 'ans1', and 'TAns' is 'ta'. The 'Node 1 when true' section (green background) has 'Mod' set to '=', 'Score' set to 1, 'Penalty' set to 0, and 'Next' set to '[stop]'. The 'Node 1 when false' section (red background) has 'Mod' set to '=', 'Score' set to 0, 'Penalty' set to an empty field, and 'Next' set to '[stop]'. There are text areas for 'Node 1 true feedback' and 'Node 1 false feedback'. A blue button labeled 'Add another node' is at the bottom.

## Step 11: Add more nodes (optional)

1. You can click the 'Add another node' to expand the answer tree. After clicking the button, one more node will appear.

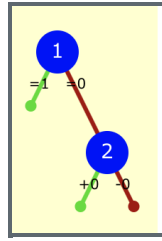


2. Link the nodes together. If the student answer is not fully correct (checked by Node 1), then more checking can be done to give scores to the partially correct answer by Node 2. To do it, please set the 'Next' setting to 'Node 2' in the red area. Then the two nodes are linked.

Node 1 when false

Mod = Score 0 Penalty [stop] Next [stop] ✓ Node 2

Answer note prt1-1-F



3. In Node 2:

1) 'SAns' need to be 'ans1', means the student input.

2) 'TAns' is a predefined partially correct answer. If this answer is complex, it can be defined in 'Question variables' in Step 6.

3) Define the score of the partially correct answer in the green area, and the score of the wrong answer in the red area.

**Node 2**

Answer test AlgEquiv SAns ans1

TAns ta2 Test options Quiet No

**Node 2 when true**

Mod + Score 0.6 Penalty Next [stop]

Answer note prt1-2-T

Node 2 true feedback

**Node 2 when false**

Mod - Score 0 Penalty Next [stop]

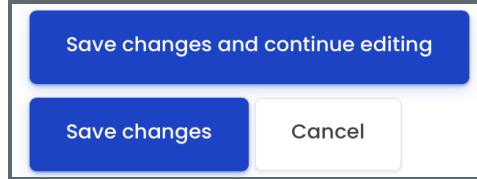
Answer note prt1-2-F

Node 2 false feedback

Delete node 2

## Step 12: Save the question

Click 'save changes and continue editing' or 'save changes' button to save the question.



Save changes and continue editing

Save changes Cancel

### Tips:

The random variables, such as variable a and b, need to be covered with '[[ ]]', the whole formula needs to be covered with '\$\$' before and after, so that the system knows it is a random variable.

### Note:

For more information about Variable Numeric question type, please access the official documentation: <https://www.open.edu/openlearncreate/mod/oucontent/view.php?id=52747&section=2.1.2>

Online URL: <https://knowledgebase.xjtlu.edu.cn/article/stack-question-type-183.html>