

What this guide covers:

- [Adding and formatting maths and science content in learnonline](#)
- [Questions with ‘complex’ answers](#)
- [How students can upload answers to questions with complex answers](#)

It is highly recommended you provide a practice exam if using maths and science questions.

Adding and formatting maths and science content in learnonline

When developing online exam questions, maths and science content should be entered so that it is accessible and that it displays correctly in learnonline. It is **not** appropriate to add images of formulae or use textual notation (e.g. $\sqrt{51} \times (1i - 5j + 5k)^2$).

In learnonline, the [MathJax display engine](#) (website link opens in a new window) transforms LaTeX into content that works across all browsers. Leveraging the MathJax extension allows us to enter maths and science notation so that it will display accurately for all students and gives them access to a range of accessibility functions.

For example:

The screenshot shows a WYSIWYG editor interface. On the left, the input text is:


```

    \[ \begin{cases} 2x+3y=10 \\ -5x+2y=13 \end{cases} \]
    
```

 Below this, the text says "We can write this in matrix form." followed by:


```

    \[ \underbrace{\begin{pmatrix} 2 & 3 \\ -5 & 2 \end{pmatrix}}_A \underbrace{\begin{pmatrix} x \\ y \end{pmatrix}}_X = \underbrace{\begin{pmatrix} 10 \\ 13 \end{pmatrix}}_B \]
    
```

 On the right, the rendered output shows the same text but with the equations displayed as a system of linear equations and the matrix equation:

$$\begin{cases} 2x + 3y = 10 \\ -5x + 2y = 13 \end{cases}$$

$$\underbrace{\begin{bmatrix} 2 & 3 \\ -5 & 2 \end{bmatrix}}_A \underbrace{\begin{bmatrix} x \\ y \end{bmatrix}}_X = \underbrace{\begin{bmatrix} 10 \\ 13 \end{bmatrix}}_B$$

LaTeX can be entered directly into the WYSIWYG editor using the $[]$ or $()$ to enclose operators. Alternatively, the TinyMCE and ATTO editors both have rudimentary equation editors. For information on how to use the maths editors, see the help guides below, which open in new windows.

[Mathematical and Scientific Notations Help Guide – \(TinyMCE editor\)](#)

[Mathematical and Scientific Notations Help Guide – \(ATTO editor\)](#)

Questions with ‘complex’ answers

If you need students to show their working-out, draw diagrams/graphs or other more complex information the standard quiz question types will not be sufficient (e.g. multiple-choice, numerical, calculated etc.).

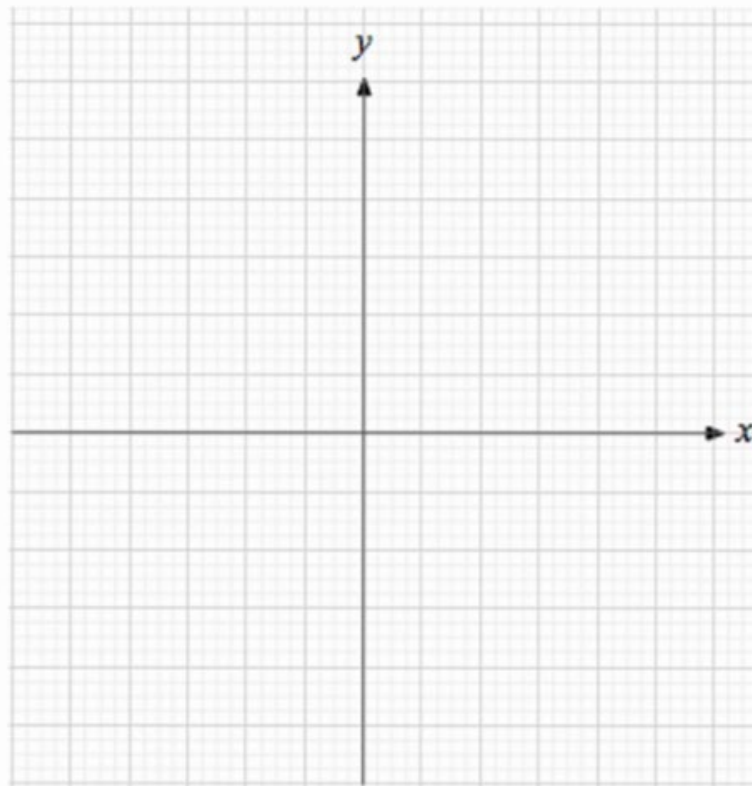
The recommended option is an ‘essay question’ type that allows students to upload a digital copy of their work.

Different ways to ask the question

You can still create the equation in an essay question as outlined on page 1 of this guide. Students then prepare their answers outside of learnonline (e.g. on paper) before uploading their answer to the quiz.

Alternatively, you might prefer to create a printable document that includes the question and a space for the student to answer. For example:

Sketch the graph of $y = (x - 2)^2 + 3$, showing all important features.



See the guide *Questions Types in an Online Quiz/Essay Questions*

Example instructions for students

For some of the questions in this exam, you will need to submit digital versions of your work (PDF or DOC). There are several different methods you can use to create a digital file and each approach requires you to use some technology. Select the one that is easiest for you, but remember, the quality needs to be high enough that we can easily read it.

Digital drawing

There are several different ways to draw digitally, you could use a touch-screen laptop, tablet or WACOM device. When digitally drawing we recommend you use your device with Microsoft Word 'inking'. The video [Using your tablet in word](#) (UniSA login required) takes you through the basics (Note: this video is for WACOM devices but will also work for other touch-screen devices).

Converting handwriting

This approach requires you to handwrite your responses on paper and then digitize them. First, you will need do you work on a piece of A4 paper, then either: use a scanner to make a digital copy of the work, or take a photograph with your mobile phone or digital camera (note: please ensure good lighting). Then send your digital files from the scanner, phone or camera to your computer. If you have calculations that run across multiple pages, use a program such as Microsoft Word to insert the image files in the correct order on the page, then save the file as a DOC or as a PDF for submission.

Remember to number your answers corresponding to the exam question.

Equation editors

Finally, you may decide to use the Microsoft Word Equation Editor to write your responses. The equation editor lets you use your keyboard and mouse to select different maths/science building blocks to create formulae. More information can be found on the [Microsoft support website](#).

Once you have a digital copy of your responses, you will need to upload them to the online exam.