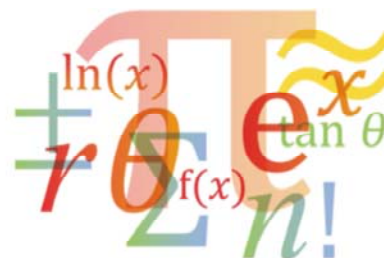


## How to... Guide

How to ... get unstuck



Version 1

Cambridge  
Pathway 

In their previous mathematical studies, learners may have been used to answering a question immediately and gaining satisfaction from getting it correct. At AS & A Level, however, learners will encounter questions they cannot answer straight away. They may attempt to use a method and find it doesn't work, or they may find they cannot progress beyond a certain step. Learning how to deal with being stuck, and to get unstuck, is an important part of learning mathematics. This guide gives some suggestions for supporting learners and helping them to develop resilience.

### Why do learners need to learn how to get unstuck?

- At AS & A Level, the emphasis is much more on the process of deciding what methods they need and applying them
- Being stuck is normal at this level so they need to learn what to do
- Being stuck is immensely frustrating!
- Learners may conclude that they are not suited to AS & A Level Mathematics
- As a teacher, you can help them to develop strategies for getting unstuck.

Learners may not always have a source of help available e.g. in an exam. You want them to learn to be more independent and to persevere when faced with a challenge. If you model for your learners the suggestions that follow, you will help them to internalise the questioning so that they can apply it for themselves next time they are stuck.

### Going back to the question

- Does reading the question again slowly and carefully again give them any more ideas?
- Can they explain the question in their own words?
- What information do they know from the question?
- What does it ask them to find?
- They should write down any new ideas that they think of

## Choosing possible methods

- Learners often rush to start a method. If this doesn't work, they feel stuck
- When choosing a method, they should ask themselves:
  - Does this question remind me of something?
  - What can I do with the information I have? Can I combine it? Can I use something else I know to help me?

It often pays to think carefully about the options before starting to write anything. For example, learners often find trigonometric proofs challenging because they can reach a dead end and do not know what to do. This is sometimes because they are not confident with using trigonometric identities or they have made a mistake with brackets. Alternatively it may be that there is more than one way of proving a statement and they have chosen the more complicated route.

### What might help? 1

- Is there a diagram or a graph given in the question?
- Is there anything else they could add to it?
- If there is no diagram or graph, could they draw one?
- Can they simplify the problem?

## What might help? 2

- Being systematic and looking for patterns  
e.g. for an algebraic problem, it may help to think of a numerical analogy and to try different values
- Thinking carefully before trying a different method. Why might this work when the earlier attempt didn't work?
- Trying to appreciate exploring a question instead of wanting to get quickly to an answer

### What might help? 3

- Checking their work for errors  
e.g. sign errors, missing brackets, incorrect expansion (algebraic and trigonometric), incorrect cancelling, dimensional errors in mechanics
- Reviewing worked examples in their notes or a textbook
- Leaving the problem for a while and coming back later (if possible)
- Discussing the problem with a friend
- Looking it up on the internet

Independent learners develop resourcefulness: they have various sources of help and know how to use them. If they know some practical steps to take, learners are less likely to panic when they get stuck.

### Why is being stuck a good thing?

- It helps learners to learn!
- They develop perseverance in sorting out their own difficulties
- They become more creative and flexible
- They develop expertise so that next time they can draw on more possible approaches
- These skills will stand them in good stead for further study of mathematics beyond the AS & A Level course

Becoming more resilient is desirable for learners in any sphere of life, not just academic study.