Outcome	AEx4	Student can consistently:	Factorise simple expressions.
How the topic is examined		- Examined through test paper questions. - Questions are equally likely to appear on calculator or non-calculator papers. - Questions will ask students to 'Factorise', 'Factorise fully' or 'Factorise completely'. If the question says factorise fully/completely this means that students have to take out more than one factor.	
Prior knowledge		- Students should be confident with: - Expanding brackets (AEx1) - Index laws (AEx3) - Highest common factor (HCF) - In addition questions involving simple factorising can have links to: - Factorising quadratic expressions (AEx7) - Simplifying algebraic fractions (AEx11)	
Suggested tuition approaches		- Students need to understand that factorising is the opposite of expanding. Students therefore need to realise that they will need to introduce at least one pair of brackets. - Students may need reminding that factors are numbers that go into other numbers (without a remainder). So for example the factors of 24 are 1, 2, 3, 4, 6, 8, 12 and 24). Algebraic expressions can also have factors. - This objective focusses on single bracket factorising. - There are two possible questions that could be asked: - Factorise – means that there is one factor of the terms given. - Factorise fully – means that there is likely to be more than one factor. - The steps in factorising an expression: - Determine the common factor(s) of each term in the expression given. - Remove this to the front of a set of brackets. - Divide each term by the factor you have removed. These terms will go into the bracket. Instead of asking students to divide, they find it easier to ask 'what do you need to multiply by?' - Students can easily check if they are correct by expanding their answer (AEx1). It should equal the expression that was given at the start. If it is not correct they should go back and check their answer.	

	• The table below shows the most likely type of questions students get asked.

Question	Answer
Factorise $15x + 20$	5(3x+ 4)
Factorise y^2 - 4y	y(y - 4)
Factorise fully $15m^2 + 9m$	$3m(5m + 3)$
Factorise fully $g^2h + gh^3$	$gh(g + h^2)$

- You can see the first two expressions students have to simply remove a number or single letter. In the other expressions there is more than one factor.
- It is important to take out the highest common factor of all the terms.

Common errors and misconceptions

- A common mistake is that students take out a factor but not the highest. For example $18x + 24$ students might do $3(6x + 4)$, but the answer needed is $6(2x + 3)$. One way to check is to see if the expression in the brackets has any more common factors.
- Another mistake is that students don't take out enough factors when the question asks to factorise fully.
- When factorising an expression like $x^2 + x$ they forget the coefficient of x is 1 and therefore the answer should be $x(x + 1)$

Suggested resources

- Questions
  - http://www.cimt.org.uk/projects/mepres/allgcse/pr10-es.pdf (p67)
  - https://corbettmaths.files.wordpress.com/2013/02/factorisation-pdf.pdf
- Past GCSE Questions
  - https://keshgcsemaths.files.wordpress.com/2013/11/58_algebra_expand-and-factorise.pdf
- Video tutorial
  - http://corbettmaths.com/2013/02/06/factorisation/