Factorising

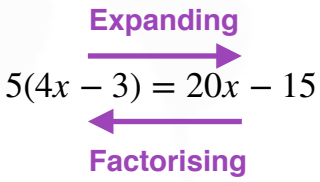
Starter

1. **(Review of a previous lesson)**
   Expanding brackets: (a) $5(4x-3)$ (b) $8x(7x+9)$ (c) $-7x^2(6-4x)$

2. Simplify: (a) $a \times a$ (b) $p \times p^2$

Notes

Factorising is the opposite of expanding brackets.



To factorise an expression look at each term of the expression and decide which are the common factors. These factors could be ***numbers or letters***.

The final answer needs to have the ***highest common factor (HCF)*** in front of the bracket.

For example: $8x + 12 = 2(4x + 6)$

This is correct but it is not the final answer because 2 is not the HCF of $8x$ and 12. It is fine to have two bites at the cherry though.

$$8x + 12 = 2(4x + 6) = 2 \times 2(2x - 3) = 4(2x - 3)$$

But if you can spot the HCF at the start, it is best.

Success criteria — factorising

1. Look at the ***coefficients*** (i.e. the numbers in front of the letters) in each term — ***take out the HCF.***
2. Look at the ***letters*** in each term — ***take out the HCF.***
3. After factorising, look at the terms in the bracket and see if you can take out anything else out as a factor. If so, take it out and multiply the term in front of the bracket.

N.B. Always check your answer by expanding the bracket mentally and seeing if it is the same as the question.

E.g. 1 Factorise: (a) $12x + 16$ (b) $x^2 - 7x$ (c) $5x^3 + x^2$

Working: (a) $12x + 16 = 4(3x + 4)$

E.g. 2 Factorise: (a) $12xy - 3yz$ (b) $6x^2y - 5xy$ (c) $8p - 16pqr$

Working: (a) $12xy - 3yz = 3y(4x - z)$

E.g. 3 Factorise: (a) $4x - 8y + 6z$ (b) $ab^2 - a^3bc + a^2b^3c^4$

Working: (a) $4x - 8y + 6z = 2(2x - 4y + 3z)$

Video: Factorising

Solutions to Starter and E.g.s

Exercise
p136 Ex 8.3 Qu 1-10

Summary
Factorising is the opposite of expanding brackets.

Factorising:
1. Look at the coefficients (i.e. the numbers in front of the letters) in each term — take out the HCF
2. Look at the letters in each term — take out the HCF
3. After factorising, look at the terms in the bracket and see if you can take out anything else out as a factor. If so, take it out and multiply the term in front of the bracket.

The final answer needs to have the ***highest common factor (HCF)*** in front of the bracket.

N.B. Always check your answer by expanding the bracket mentally.

Textbook answers (only available during a lockdown)