

Factorising an Expression that Contain a Common Factor - PDF Copy

The presentation contains the slides below and has the objectives of enabling students to: i. **Understand what is meant by factorising** and ii. **Factorise an expression containing terms with a common factor.** There is an explanation that shows how to factorise an expression containing terms that have a common factor.

An Introduction to Factorising

Objective
Understand what is meant by factorising
Factorise an expression containing terms with a common factor

Grade C Topic

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To get rid of the brackets, we multiply the terms inside the brackets by 3 like this...

$$x(5x+3) \rightarrow 5x^2+3x$$

$x \times 1x = 1x^2$
 $x \times 3 = 3x$

We call this **multiplying out** or **expanding** the brackets

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Often we want to do the reverse and put terms into brackets. We call this **factorising**

$$5x^2+3x \rightarrow x(5x+3)$$

Here is how to do it...

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Write out the expression putting in all the multiplication signs

$$5x^2+3x$$

$$5 \times x \times x + 3 \times x$$

$$x(5x+3)$$

Look for factors that each of the terms have in common

Put this common factor outside a pair of brackets

Put the remaining terms inside the brackets

We've **factorised** the expression

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Here is another example

$$x^2-3x$$

$$x \times x - 3 \times x$$

$$x(x-3)$$

Put the common factor outside the brackets like this...

Put the remaining terms inside the brackets like this...

We have **factorised** the expression

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Factorise these expressions:

- $3x^2+4x \rightarrow x(3x+4)$
- $7x^2+x \rightarrow x(7x+1)$
- $x^2+5x \rightarrow x(x+5)$
- $2x^2+5xy \rightarrow x(2x+5y)$
- $7x^2y+4xy \rightarrow x(7xy+4y)$
- $5x^3+2x^2 \rightarrow x^2(5x+2)$

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Here is an example where we factorise the numbers

$$6x+15$$

$$f: 3 \times 2 \quad 11: 3 \times 1$$

$$\rightarrow 3 \times 2x + 3 \times 5$$

$$\rightarrow 3(2x+5)$$

f and 11 have a common factor of 3

Now, put the common factor outside a pair of brackets like this...

Put the remaining terms inside the brackets like this...

We have **factorised** the expression

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Factorise these expressions:

- $3x+6 \rightarrow 3(x+2)$
- $4x+12 \rightarrow 4(x+3)$
- $10x^2+25x \rightarrow 5x(2x+5)$
- $4x^2+8xy \rightarrow 4x(x+2xy)$
- $6x^2y+18xy \rightarrow 3x(2xy+6y)$
- $15x^3+35x^2 \rightarrow 5x^2(3x+7)$

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Here is an example with numerical and algebraic common factors

$$10rt^2-15r^3t$$

$$11: 2 \times 1 \quad 11: 3 \times 1$$

$$r: r \times t \quad r: r \times r \times r$$

$$\rightarrow 2 \times 5 \times r \times t \times t - 3 \times 5 \times r \times r \times r \times t$$

$$\rightarrow 5rt(2t-3r^2)$$

Common factor outside the brackets

Remaining terms inside the brackets

We have **factorised** the expression

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Factorise these expressions:

- $4ab+6b \rightarrow 2b(2a+3)$
- $5rv^2+15v \rightarrow 5v(rv+3)$
- $12mu^2+20u \rightarrow 4u(3mu+5)$
- $18t^2+9tu \rightarrow 9t(2t+u)$
- $12x^2y+15xy^2 \rightarrow 3xy(4x^2+5y)$
- $24rtv^2+36r^2v \rightarrow 12rtv(2v+3r)$

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