CLASS 8 MATHS · 2026-27

Factorisation

Factorisation

34	30	3
QUESTIONS	MINUTES	EXERCISES

This belongs to _____ **Date** _____

WHAT YOU'LL GET GOOD AT

- Takes out the highest common factor before anything else
- Recognises a difference of squares and a perfect square trinomial
- Factorises a four-term expression by grouping
- Splits the middle term of a quadratic, including when the leading coefficient is not 1
- Chooses the method in the right order rather than by trial

Take your time, and have a go at every one. If you get stuck, look at the orange box — Ollie has already done one for you.

Factorisation

Factorisation · 34 questions · tick each box as you finish

Exercise 1 of 3 · 10 questions Factorise by taking out the common factor.

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

$12a^2b - 18ab^2 = 6ab(2a - 3b)$. Two things to check every time: the number factor is the highest common one (6, not 2 or 3), and the letters are taken to the lowest power that appears in both (ab, not a^2b). Taking out a partial factor is not wrong exactly, but it leaves work behind and loses marks that were already earned.

1) $6x + 9$

2) $12a^2b - 18ab^2$

3) $5x^2 + 10x$

4) $7pq + 14p$

5) $4m^3 - 8m^2$

6) $8x + 20$

7) $15a^2b - 25ab^2$

8) $6x^2 + 9x$

9) $3m^3 - 12m^2$

10) $9pq + 12p$

Exercise 2 of 3 · 12 questions Factorise using an identity, or by grouping.

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

ax + ay + bx + by = (a + b)(x + y). Grouping works when there are four terms and no factor common to all of them. Take a from the first pair and b from the second: a(x + y) + b(x + y). Both now share (x + y), so it comes out. If the second bracket does not match the first, try pairing the terms differently before deciding grouping will not work.

1) $x^2 - 16$

2) $9a^2 - 25$

3) $x^2 + 10x + 25$

4) $4y^2 - 12y + 9$

5) $ax + ay + bx + by$

6) $x^2 + 3x + 2x + 6$

7) $x^2 - 49$

8) $16a^2 - 81$

9) $x^2 + 14x + 49$

10) $9y^2 - 24y + 16$

11) $px + py + qx + qy$

12) $x^2 + 5x + 3x + 15$

Exercise 3 of 3 · 12 questions Factorise by splitting the middle term.

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

$2x^2 + 7x + 3 = (2x + 1)(x + 3)$. When the number in front of x^2 is not 1, the two numbers must multiply to the first coefficient times the last - here $2 \times 3 = 6$ - and add to the middle one, 7. That gives 6 and 1, so write $2x^2 + 6x + x + 3$ and group: $2x(x + 3) + 1(x + 3)$. Children who learn the shortcut for $x^2 + bx + c$ and are never shown this extension get stuck on every question where the leading coefficient is not 1.

1) $x^2 + 7x + 12$

2) $x^2 - 5x + 6$

3) $x^2 + x - 12$

4) $x^2 - 2x - 15$

5) $2x^2 + 7x + 3$

6) $3x^2 - 10x + 8$

7) $x^2 + 11x + 30$

8) $x^2 - x - 20$

9) $x^2 - 9x + 20$

10) $x^2 + 2x - 24$

11) $2x^2 + 9x + 4$

12) $3x^2 + 11x + 6$

All done? How did that feel?

Colour in a star. Three stars means you could teach it to someone else.

☆ ☆ ☆ Tricky · Getting there · Easy now

Answer key

For grown-ups

Factorisation · keep this page back until your child has finished.

1. Factorise by taking out the common factor.

1) $3(2x + 3)$.
2) $6ab(2a - 3b)$. The common factor is $6ab$ - take the highest one, not just any one.
3) $5x(x + 2)$.
4) $7p(q + 2)$.
5) $4m^2(m - 2)$.
6) $4(2x + 5)$
7) $5ab(3a - 5b)$
8) $3x(2x + 3)$
9) $3m^2(m - 4)$
10) $3p(3q + 4)$

2. Factorise using an identity, or by grouping.

1) $(x + 4)(x - 4)$. Difference of squares.
2) $(3a + 5)(3a - 5)$. Since $9a^2 = (3a)^2$.
3) $(x + 5)^2$. A perfect square, because $25 = 5^2$ and $10x = 2 \times x \times 5$.
4) $(2y - 3)^2$. Since $4y^2 = (2y)^2$, $9 = 3^2$ and $12y = 2 \times 2y \times 3$.
5) $(a + b)(x + y)$. Group as $a(x + y) + b(x + y)$.
6) $(x + 3)(x + 2)$. Group as $x(x + 3) + 2(x + 3)$.
7) $(x + 7)(x - 7)$
8) $(4a + 9)(4a - 9)$
9) $(x + 7)^2$
10) $(3y - 4)^2$
11) $(x + y)(p + q)$
12) $(x + 3)(x + 5)$

3. Factorise by splitting the middle term.

1) $(x + 3)(x + 4)$. Two numbers multiplying to 12 and adding to 7.
2) $(x - 2)(x - 3)$. Product 6, sum -5, so both are negative.
3) $(x + 4)(x - 3)$. Product -12, sum +1.
4) $(x - 5)(x + 3)$. Product -15, sum -2.
5) $(2x + 1)(x + 3)$. Product $2 \times 3 = 6$, sum 7, so split as $6x + x$: $2x^2 + 6x + x + 3$.
6) $(3x - 4)(x - 2)$. Product $3 \times 8 = 24$, sum -10, so split as $-6x - 4x$.
7) $(x + 5)(x + 6)$
8) $(x - 5)(x + 4)$
9) $(x - 4)(x - 5)$
10) $(x + 6)(x - 4)$
11) $(2x + 1)(x + 4)$
12) $(3x + 2)(x + 3)$

WHILE YOUR CHILD WORKS

- Ask 'which method, and why that one?' before any factorising happens. Common factor, identity, grouping, middle term - in that order.
- Check the answer by expanding it back. It takes fifteen seconds and catches every error.
- When the number in front of x^2 is not 1, the product to aim for is first coefficient times last. That extension is the one most often never taught.