

Collect expand and factorise

Pearson Edexcel GCSE Mathematics 1MA1 • L018
Foundation and Higher • 60 minutes • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

Collect like terms, expand a single bracket and factorise a common factor. Explain how these equivalent forms are connected.

Work without a calculator except where a check is invited. Write on the lines or replace them with typed answers. Attempt before reading intentional practice feedback.

Connect & Check

Like terms: identical variable part including powers. Expand: multiply out a bracket. Factorise: express as a product. Common factor: divides every term. Equivalent: same value for all allowed inputs.

R1

Evaluate $3x+2x$ when $x=4$.

R2

Find HCF of 12 and 18.

R3

Calculate $-2 \times (-3)$.

Share | In pairs, predict the first step for this problem: The distributive law $a(b+c)=ab+ac$ shares multiplication across a sum. Thus $3(x+2)=3x+6$. Reversing this gives factorisation. Collecting $3x+2x$ counts five x units; x and x^2 are different units. Compare your reasons before using the worked model.

Present through worked examples

The distributive law $a(b+c)=ab+ac$ shares multiplication across a sum. Thus $3(x+2)=3x+6$. Reversing this gives factorisation. Collecting $3x+2x$ counts five x units; x and x^2 are different units.

D1

Model: $3x+2x-x=4x$. Now simplify $5a-2a+4$.

D2

Model: $3(x+2)=3x+6$. Complete $4(y-3)=4y+ \underline{\hspace{1cm}}$.

D3

Model: $-2(x-3)=-2x+6$. Now expand $-3(a+2)$.

D4

Model: $6x+9=3(2x+3)$. Now factorise $8a+12$ fully.

Apply with less support

Group only like terms. Multiply every term inside a bracket, including its sign. To factorise, take a common factor from every term. Expand again and substitute a value to check.

A1

Simplify $3x+2x$; $3x+2y$; $3x^2+2x^2$; $3x^2+2x$. Explain which pairs combine.

A2

Expand $5(x-2)$, then simplify $5(x-2)+3x+4$.

A3

A rectangle has sides $x+2$ and 3 cm. Write its perimeter and simplify it.

Optional support: Compare powers as well as letters.

Optional check after C2: substitute $x=2$ in $3(x+4)-2(x+1)$ and $x+10$; both give 12. Numerical agreement is a check, not proof for every x .

Apply and extend reasoning

C1

A learner factorises $6x+12$ as $6(x+12)$. Explain the error and repair it.

C2

Show that $3(x+4)-2(x+1)$ is equivalent to $x+10$ for every x .

Intentional practice feedback — read after attempting

A1: $5x$; $3x+2y$; $5x^2$; $3x^2+2x$.

A2: $5x-10$; $8x-6$.

A3: $2(x+2)+6=2x+10$ cm.

C1: Expanding gives $6x+72$. Correct: $6(x+2)$.

C2: $3x+12-2x-2=x+10$.

Correct one response and explain your change. Stretch is available to either tier; temporary support needs do not determine entry tier.

Recall & Review through retrieval

Work without notes. Six retrieval points; this attempt does not establish mastery. Equivalent exact numeric forms are accepted. Where accuracy is requested, also state the requested form in your written work.

Q1 Coefficient of x in $3x+5x$

Q2 Constant in $4(x+3)$

Q3 Constant in $-2(x-5)$

Q4 HCF of 12 and 18

Q5 Value of $2x+10$ at $x=3$

Q6 $3x+2$ for $x=-2$

Intentional retrieval feedback

Q1 8; Q2 12; Q3 10; Q4 6; Q5 16; Q6 -4 . Correct and retry tomorrow, then in one week.

Prove independently and improve

P1–P2: five minutes without notes; 4 marks. Your teacher reviews explanations and method marks.
P3 has no mark.

P1

Expand and simplify $2(x+5)+3x$. [2]

P2

Factorise $12x+18$ fully and expand your answer to check. [2]

P3

Explain one corrected error. Set a fresh question and a date to check it without support.

Teacher feedback: _____

Fresh question and retry date: _____

Delayed independent evidence: _____

Prepare for the next lesson

L019: Linear equations

F1

Tomorrow expand $-2(x+4)$ and factorise $10x+15$.

F2

Before L019, solve $x+4=11$ and explain why subtracting 4 from both sides preserves equality.

Read and prepare

An equation states that two expressions are equal. Solve by applying the same inverse operation to both sides, then substitute the solution into the original equation.

Digital workbook: save locally where available; export a JSON backup before closing or moving the file. Restore only this lesson/version. Printing records answers, not mastery. Live browser checks remain pending; use Word/PDF if required.

Optional extension activities

Stretch

Expand and simplify $3(2x-5)-2(x+4)$.

Deep challenge

Factorise $6x^2+9x$ fully and check by expansion.

Recall & Review: feedback and extension integration

Source-integrated WWW/EBI and extension page

Lesson L018: Collect expand and factorise

Objective: Collect like terms, expand a single bracket and factorise a common factor. Explain how these equivalent forms are connected.

Timing for a 60-minute lesson

0-7 Connect & Check; 7-14 Share; 14-25 Present/model; 25-44 Apply route choice/practice; 44-52 independent exam-style check; 52-60 Recall & Review, WWW/EBI and next step.

Recall & Review evidence

At the end of the lesson, solve a fresh question without prompts, explain a check, correct one error and record the next practice step.

What Went Well (WWW)

I wrote the algebraic structure accurately and used a valid step-by-step method.

Even Better If (EBI)

I will show inverse operations clearly, keep signs/brackets accurate and substitute back to check.

Integrated stretch and deep challenge

Stretch: Expand and simplify $3(2x-5)-2(x+4)$.

Deep challenge: Factorise $6x^2+9x$ fully and check by expansion.

My next-step response
