

Slide by slide delivery map

Pearson Edexcel GCSE Mathematics 1MA1 • L021

25 slides • 60 minutes • Teacher use only • Lesson resources

REACH FOR THE STAR | GCSE MATHEMATICS

01 Formulae and rearranging 1 min Recall

Substitute into formulae and change the subject by inverse operations. State necessary restrictions and check with values.

02 The goal and the evidence 1 min Recall

L017 substitution; L018 factorising; L019 equations; L020 forming models.

03 Starting-point diagnostic 5 min Recall

If brackets are omitted, compare $(y-4)/3$ with $y-4/3$ at $y=10$. If the same letter is on both sides, use the separate Higher route after common-factor work. Recheck $y=2x+6$ as $x=(y-6)/2$.

04 Worked example and your turn 3 min Discover

$a=b+7$. Add 7 on both sides.

05 Worked example and your turn 3 min Discover

$n=(C-2)/5$. Subtract 2 then divide the whole difference.

Delivery continued

06 Worked example and your turn 3 min Discover

$w = (P - 2l)/2$ or $P/2 - l$. Subtract $2l$ then divide by 2.

07 Worked example and your turn 3 min Discover

$t = d/v$. $vt = d$, then divide by v ; original $t = d/v$.

08 A method you can explain 2 min Discover

Identify the required subject and undo operations in reverse order on both sides. Keep grouped numerators in brackets. Check by substitution into both versions; do not divide by zero.

09 Diagnostic pause 3 min Apply

Make x the subject of $y = 3x + 4$: A $y - 4/3$, B $(y - 4)/3$, C $(y + 4)/3$. Answer B.

10 Careful variation 4 min Apply

$(y - 3)/2$; $y/2 - 3$; $2(y - 3)$. Read the complete operation chain.

Delivery continued

11 Independent application 6 min Apply

$h=2A/b$; $h=12$. Multiply by 2 then divide by b .

12 Use the method in context 4 min Apply

$d=(C-4)/3$; 7 km. Remove the fixed cost before finding distance.

13 Intentional practice feedback 2 min Apply

Remove the fixed cost before finding distance. Optional check: choose $x=2$ in $y=3x+4$ to give $y=10$. Enter $(10-4)\div 3$ to recover 2. Parentheses must reflect the written numerator.

14 A claim to test 4 min Challenge

Yes: divide both terms of $P-2w$ by 2. Distribution of division over a sum/difference.

15 Deepen the reasoning 4 min Challenge

At $y=10$ it gives $-2/3$, but $x=2$ is correct. Use $x=(y-4)/3$. Subtract before dividing.

Delivery continued

16 Retrieval without notes 2 min Prove

Answers: 5, 12, 6, 3, 7, 4. Completion is not mastery.

17 Retrieval without notes 2 min Prove

Answers: 5, 12, 6, 3, 7, 4. Completion is not mastery.

18 Independent exit evidence 2 min Prove

$y+3=4x$ M1; $x=(y+3)/4$ A1. Keep whole numerator grouped.

19 Independent exit evidence 3 min Prove

$2A=bh$ M1; $h=2A/b$ A1. Accept equivalent forms.

20 Feedback and next steps 2 min Prove

If brackets are omitted, compare $(y-4)/3$ with $y-4/3$ at $y=10$. If the same letter is on both sides, use the separate Higher route after common-factor work. Recheck $y=2x+6$ as $x=(y-6)/2$.

Delivery continued

21 Before the next lesson 1 min Recall

An inequality describes a set of values. An open circle excludes an endpoint; a filled circle includes it. A number line shows which side of the endpoint is allowed.

22 When the subject occurs twice alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. Make x the subject of $y=ax+cx+d$: subtract d , then factorise x to get $y-d=x(a+c)$. Divide by $a+c$: $x=(y-d)/(a+c)$, provided $a+c \neq 0$. If $a+c=0$ the original reduces to $y=d$: every x works when $y=d$, and none when $y \neq d$. A different example, $p=3x+qx$, gives $p=x(3+q)$, so $x=p/(3+q)$, provided $q \neq -3$.

23 Factorise before dividing alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. Do not divide by one term of a sum. Factor the subject first and keep the entire coefficient in brackets. Dividing by a potentially zero expression needs a restriction. With zero coefficient, return to the original equation rather than using the fraction.

24 Independent Higher evidence alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. $p=x(5+r)$ M1; $x=p/(5+r)$, $r \neq -5$ A1 (both formula and restriction).

25 Independent Higher evidence alternative Higher alternative

Higher route: replace the 2-minute A3 feedback and the two 4-minute Challenge discussions with this 10-minute taught extension. Retain core P1–P2. Set HX1–HX2 as the final four minutes of that alternative, and use the shared challenges later if needed. The core route remains 60 minutes; the extension is not an additional compulsory ten minutes. Route choice reflects tier curriculum, not temporary support needs. The coefficient is the whole sum $3+k$, so division must be by that sum B1; $x=y/(3+k)$, $k \neq -3$ B1.

Recall & Review: feedback and extension integration

Lesson L021: Formulae and rearranging

Objective: Substitute into formulae and change the subject by inverse operations. State necessary restrictions and check with values.

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 one check, correct one error and record the next practice step.

What Went Well (WWW)

I represented the algebraic structure accurately, kept each transformation valid and checked the result by substitution, graph or equivalent reasoning.

Even Better If (EBI)

I will show the missing inverse operation or algebraic step, keep signs and brackets accurate and test the result in the original relationship.

Integrated stretch and deep challenge

Stretch: Rearrange $A = \pi r^2$ for positive r , then find r when $A = 49\pi \text{ cm}^2$.

Deep challenge: Rearrange $v = u + at$ for t and identify when the rearrangement is invalid.

Teacher use

Use the What Went Well (WWW) and Even Better If (EBI) prompts to write mathematics-specific feedback linked to the objective. Do not accept generic praise: identify the method, representation, reasoning or checking step that improved, then set a fresh next-step question.

Assessment evidence to inspect: Check the formative mini-test and independent workbook response against the objective. Use the teacher answers or mark guidance; group errors for reteaching. Non-calculator core; optional calculator check.