

Slide by slide delivery map

Pearson Edexcel GCSE Mathematics 1MA1 • L028

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

REACH FOR THE STAR | GCSE MATHEMATICS

01 Constructions and loci 1 min Recall

Use ruler and compass constructions and interpret loci as sets of points satisfying distance conditions.

02 The goal and the evidence 1 min Recall

L027 congruence and equal distances; L025 perpendicular angles; accurate ruler use.

03 Starting-point diagnostic 5 min Recall

If a midpoint is guessed, demand two pairs of arcs. If distance to a line is slanted, compare it with a perpendicular. If a circle is shaded for exactly 3 cm, distinguish boundary from region. Recheck with the practical sheet.

04 See the geometry 2 min Discover

Equal-radius arcs from endpoints intersect at points equally distant from both endpoints; their joining line is the perpendicular bisector. To bisect an angle, mark equal distances along its rays, then intersect equal-radius arcs from those marks. Congruent triangles explain the equal angles. Distance from a point to a line is measured along a perpendicular.

05 Worked example and your turn 3 min Discover

Line through midpoint at 4 cm, perpendicular to AB, with intersecting arcs. Equal-distance intersections determine the bisector.

Delivery continued

06 Worked example and your turn 3 min Discover

Two 35° angles; construction arcs retained. Protractor makes the starting angle, not the bisector.

07 Worked example and your turn 3 min Discover

Circle centre P, radius 3 cm. Only circumference; no interior shading.

08 Worked example and your turn 3 min Discover

Strip between parallel lines 1 cm each side, including boundaries. Distance measured perpendicular.

09 A method you can explain 2 min Discover

Use a sharp pencil, straightedge and compass; leave arcs visible. For a perpendicular from a point, an arc centred there cuts the line twice; bisect that segment and join to the point. At a point on a line, mark equal distances either side, then use equal arcs. For loci, draw each condition separately and retain their intersection.

10 Diagnostic pause 3 min Apply

Points exactly 3 cm from O form A a disc, B a circle circumference, C a line. Answer B: every point has the same radius.

Delivery continued

11 Careful variation 4 min Apply

Arc from P cuts l at X,Y; bisect XY and draw through P to l . The constructed line is at 90° .

12 Independent application 4 min Apply

Two intersections of radius-4 circles centred A and B. Both conditions must hold.

13 Use the method in context 4 min Apply

Intersect the closed radius-3 disc with the perpendicular bisector of AB. May be a segment, point or empty, depending on positions.

14 Intentional practice feedback 2 min Apply

May be a segment, point or empty, depending on positions. No calculator needed. Practical construction quality is teacher reviewed. Use a ruler to check distances and a protractor to check right angles after constructing; they do not replace compass evidence.

15 A claim to test 4 min Challenge

One equidistant point is insufficient to locate the bisector line; use two intersections, or one and the known midpoint. Joining A is generally wrong. A is not equidistant from itself and B.

Delivery continued

16 Deepen the reasoning 4 min Challenge

None; the two circles are separated since $3+3<8$. Maximum total reach is 6 cm.

17 Retrieval without notes 2 min Prove

Answers: 5, 40, 6. Completion is not mastery.

18 Retrieval without notes 2 min Prove

Answers: 90, 2, 0. Completion is not mastery.

19 Independent exit evidence 2 min Prove

Perpendicular to AB B1; passes through midpoint B1. A whole line, not just midpoint.

20 Independent exit evidence 3 min Prove

One B1; circles touch at midpoint because radii sum to separation B1. Teacher reviews reasoning.

Delivery continued

21 Feedback and next steps 2 min Prove

If a midpoint is guessed, demand two pairs of arcs. If distance to a line is slanted, compare it with a perpendicular. If a circle is shaded for exactly 3 cm, distinguish boundary from region. Recheck with the practical sheet.

22 Before the next lesson 1 min Recall

Coordinates record horizontal then vertical displacement. A translation moves every point by the same vector. Reflection preserves perpendicular distance to its mirror line.

Recall & Review: feedback and extension integration

Lesson L028: Constructions and loci

Objective: Use ruler and compass constructions and interpret loci as sets of points satisfying distance conditions.

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 selected the correct geometric fact, theorem, formula or transformation and used a clear diagram with appropriate labels and units.

Even Better If (EBI)

I will name the fact or theorem, show the substitution or construction step and check whether the size, direction and units of the result are reasonable.

Integrated stretch and deep challenge

Stretch: Construct the perpendicular bisector of an 8 cm segment. How far is its midpoint from either endpoint?

Deep challenge: A point is 3 cm from A and 4 cm from B. Describe the intersection of its loci.

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. No calculator needed. Practical construction quality is teacher reviewed. Use a ruler to check distances and a protractor to check right angles after constructing; they do not replace compass evidence..