

Bearings and scale drawings

Pearson Edexcel GCSE Mathematics 1MA1

L031 • Geometry and measures

60 minute lesson | learner resources

The goal and the evidence

Connect & Check → Share → Present → Apply → Recall & Review

Interpret three-figure bearings and construct scale drawings with accurate distance and direction.

Explain, apply and check independently.

Starting-point diagnostic

R1–R3 • Attempt without notes

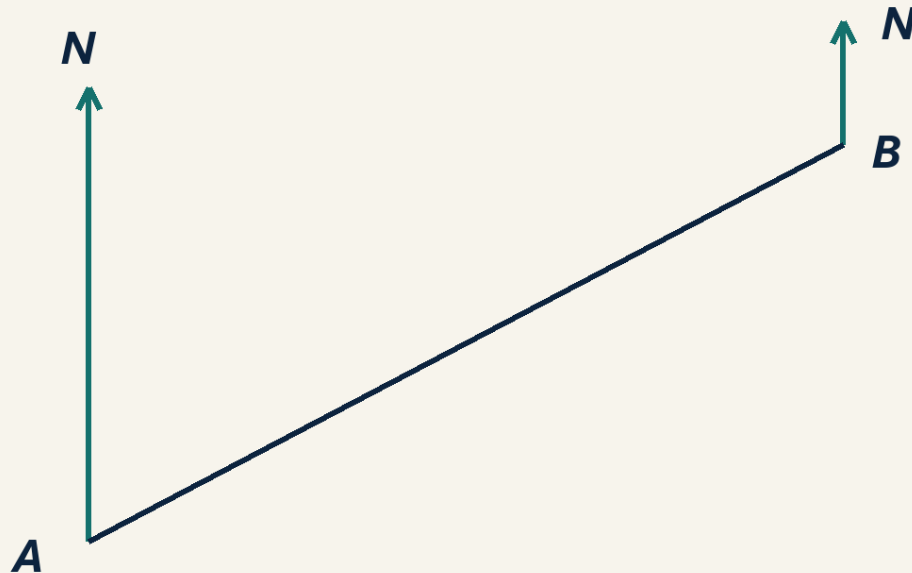
Convert 1 km to metres.

At 1 cm:2 km, what real distance is 3 cm?

Find $180+65$.

See the geometry

Use the diagram and practical sheet.



Teaching sketch • not to scale

Measure clockwise from north.

Use three figures.

Reverse bearing: turn 180° .

Worked example and your turn

D1 • Explain each step

Model: east is bearing 090° . State bearings of south and west.

Try the paired problem; check independently.

Worked example and your turn

D2 • Explain each step

Model: forward 060° reverses to 240° . Reverse bearing 125° .

Try the paired problem; check independently.

Worked example and your turn

D3 • Explain each step

Model: forward 230° reverses to 050° . Reverse bearing 310° .

Try the paired problem; check independently.

Worked example and your turn

D4 • Explain each step

Model: scale 1 cm:2 km makes 6 km into 3 cm. Draw an 8 km route at bearing 060° using this scale.

Try the paired problem; check independently.

A method you can explain

Name the fact or construction at each step.

Check against the original question.

Diagnostic pause

Choose and explain before moving on.

Bearing from A to B is 070° . Bearing B to A? A 110° ,
B 250° , C 290° .

Use your explanation to decide the next step.

Careful variation

A1 • Show your reasoning

At 1 cm:2 km, find paper lengths for 4, 6 and 10 km.

Explain your decisions and check the result.

Independent application

A2 • Show your reasoning

At scale 1:50 000, a route measures 7.2 cm. Find its real length in kilometres.

Explain your decisions and check the result.

Use the method in context

A3 • Show your reasoning

A boat travels 6 km on bearing 090° , then 4 km on bearing 000° . Draw at 1 cm:2 km; estimate direct distance and bearing from start.

Explain your decisions and check the result.

Intentional practice feedback

Read after attempting A3

About 7.2 km and 056° .

Correct one step and explain the change.

A claim to test

C1 • Show your reasoning

A learner gives $360 - 70 = 290^\circ$ as the reverse of 070° .
Explain using compass directions.

Explain your decisions and check the result.

Deepen the reasoning

C2 • Show your reasoning

Two pupils use 1 cm:1 km and 1 cm:2 km for the same route. Should the measured bearing change? Explain.

Explain your decisions and check the result.

Retrieval without notes

Q1–Q3 • Numeric answers

Bearing of east, numeric degrees

Reverse of 070° , numeric degrees

Reverse of 310° , numeric degrees

Retrieval without notes

Q4–Q6 • Numeric answers

km represented by 4 cm at 1 cm:2 km

cm for 10 km at 1 cm:2 km

Metres in 2.5 km

Independent exit evidence

P1 • Without notes • Teacher review

The bearing from A to B is 245° . Find B to A and explain. [2]

Show working and check your answer.

Independent exit evidence

P2 • Without notes • Teacher review

A scale 1:25 000 route is 8 cm. Find its real length in km, showing conversion. [2]

Show working and check your answer.

Feedback and next steps

P3 • Completion is not mastery

Explain one error you have corrected.

Set a fresh question and a delayed check.

Before the next lesson

L032: Geometry checkpoint and feedback

Complete F1 tomorrow without notes.

Attempt F2 and bring one question.

Optional stretch

A map scale is 1 cm:4 km. Two points are 7.5 cm apart. Find actual distance.

Show a method. Explain a check or counterexample.

Optional deep challenge

The bearing of B from A is 065° . Find the bearing of A from B.

Show a method. Explain a check or counterexample.

L031 Recall & Review

Bearings and scale drawings

Fresh evidence: prove the objective

Solve a new question without prompts. Explain one check, then correct one error in your working.

Objective: Interpret three-figure bearings and construct scale drawings with accurate distance and direction.

Write the next practice step before you leave. It must test the method again, not simply copy today's example.

Feedback language

Use the full phrases before the abbreviations.

What Went Well (WWW)

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

Identify the mathematical method, representation, reasoning or check that improved.

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.

Set one precise next-step action and test it on a fresh question.

Extension route

Choose this route only after the core evidence is secure.

Stretch

A map scale is 1 cm:4 km. Two points are 7.5 cm apart. Find actual distance.

Deep challenge

The bearing of B from A is 065° . Find the bearing of A from B.

Explain your reasoning clearly enough that another learner could check it.