

Y8 Maths

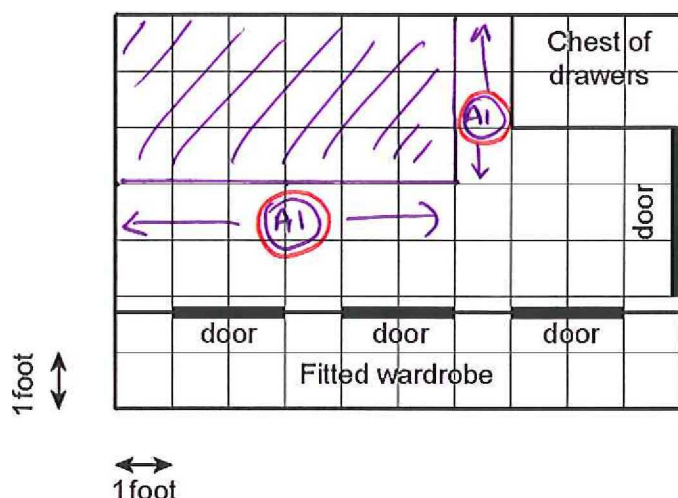
Unit 9 Test

Scale drawings and measures

Name: MARK SCHEME

CALCULATOR ALLOWED

- 1 Here is a scale plan of Julie's bedroom.



- a Her bed is 6 feet by 3 feet. Draw it to scale to fit into the corner and along the wall opposite the wardrobe.

(2 marks)

- b Will the wardrobe doors open? Explain your answer.

(B1) Yes

(A1) there are more than 2 feet between the bed and the door.
or sensible explanation involving distances.

(2 marks)

(Total: 4 marks)

- 2 Complete the scale equivalents.



- a 1 : 40 000 is equivalent to 1 cm : 400 (A1) m

$$1 \text{ cm} : 40\,000 \text{ cm}$$

$$1 \text{ cm} : 400 \text{ m}$$

(M1) Attempt to divide by 100.

(2 marks)

- b 1 m : 5 km is equivalent to 1 : 5000 (A1)

$$1 \text{ m} = 5 \text{ km}$$

$$1 \text{ m} = 5000 \text{ m}$$

(M1) Multiplies by 1000

(2 marks)

- c 2 : 350 is equivalent to 1 mm : 17.5 (A1) cm

$$2 \text{ mm} : 350 \text{ mm}$$

$$1 \text{ mm} : 175 \text{ mm}$$

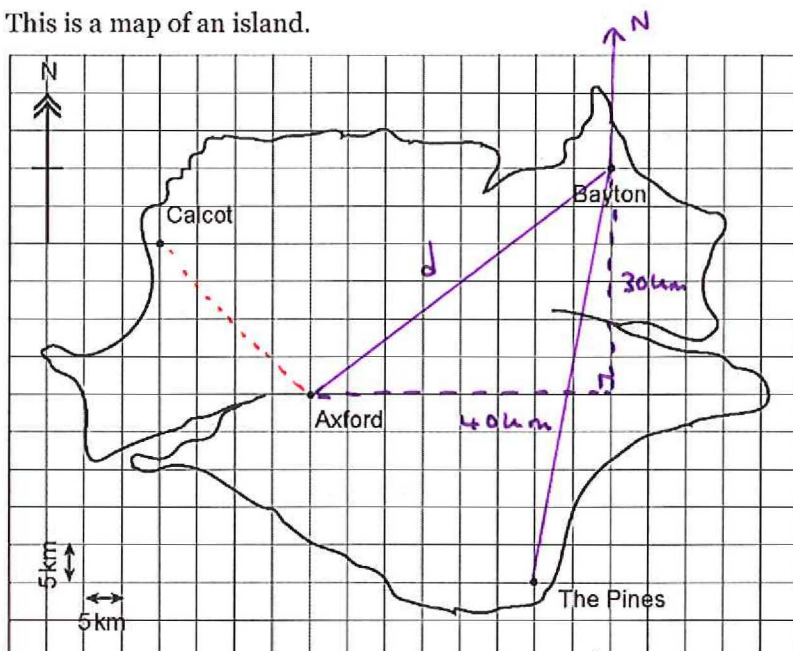
$$1 \text{ mm} : 17.5 \text{ cm}$$

(M1)

(2 marks)

(Total: 6 marks)

3 This is a map of an island.



a What is the real distance between Axford and Bayton? HINT: Do not use your ruler to calculate this.

$$d^2 = 30^2 + 40^2$$

$$d = \sqrt{30^2 + 40^2}$$

$$d = 50 \text{ km.}$$

(81) Identifies both horizontal & vertical distances.

(M1) Applies Pythag.

(A1)

50km (3 marks)

b What is the approximate compass direction from Axford to Calcot?

(A1)

NW (1 mark)

c A microlight travels from Bayton to The Pines. What is the three-figure bearing the microlight should take?

(M1) for an attempt to calculate an angle greater than 180°.

[Accept 188°-192°]

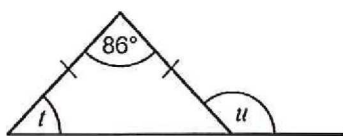
190° (A1)

(2 marks)

(Total: 6 marks)

4 Calculate the marked angles in these diagrams.

a



$$(M1) \quad t = \frac{180 - 86}{2}$$

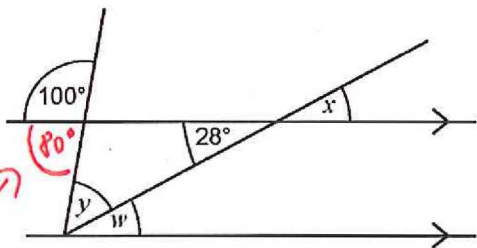
$$t = 47^\circ$$

angle $t = 47^\circ$ (A1)

angle $u = 133^\circ$ (A1)

(3 marks)

b



sight of 80 (may be in diagram) (M1)

$$y + w = 80$$

$$y = 80 - w$$

$$y = 80 - 28$$

$$y = 52^\circ$$

angle $w = 28^\circ$ (A1)

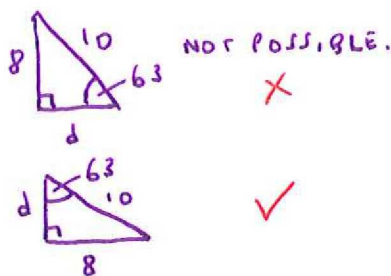
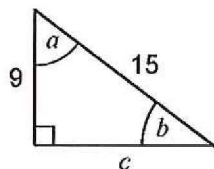
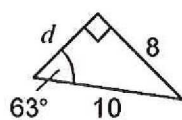
angle $x = 28^\circ$ (A1)

angle $y = 52^\circ$ (A1)

(4 marks)

(Total: 7 marks)

- 5 These triangles are similar.



- a Work out the sizes of the angles a and b .

(M1) $b = 180 - (90 + 63)$
 $= 27^\circ$

angle $a = 63^\circ$ (A1)
 angle $b = 27^\circ$ (A1)
 (3 marks)

Alternative

- b Work out the lengths of the sides c and d .

(M2) could also be answered for ratio of lengths twice

s.f. length $= \frac{15}{10} = 1.5$ (M1) Calculates s.f.

$c = 1.5 \times 8 = 12$ units

$d = 9 \div 1.5 = 6$ units

(M1) uses s.f. in calculations.

side $c = 12$ (A1)

side $d = 6$ (A1)

(4 marks)

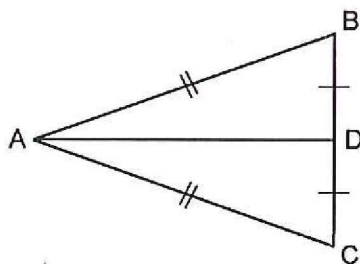
(Total: 7 marks)

a) $\frac{15}{10} = \frac{c}{8}$ (M1)

R $\frac{15}{10} = \frac{9}{d}$ (M1)

- 6 ABC is an isosceles triangle.

D is the midpoint of BC.



- a Show that the triangles ABD and ACD are congruent, giving reasons for each of the steps made. Right all of your working out in the space below.

In $\triangle ABD$ & $\triangle ACD$

$AB = AC$ ($\triangle ABC$ is isosceles) (A1) Reasons

$BD = CD$ (D is the mid-point of BC) (A1) must

$AD = AD$ (AD is a common line) (A1) be given.

$\therefore \triangle ABD = \triangle ACD$ (SSS) (A1)

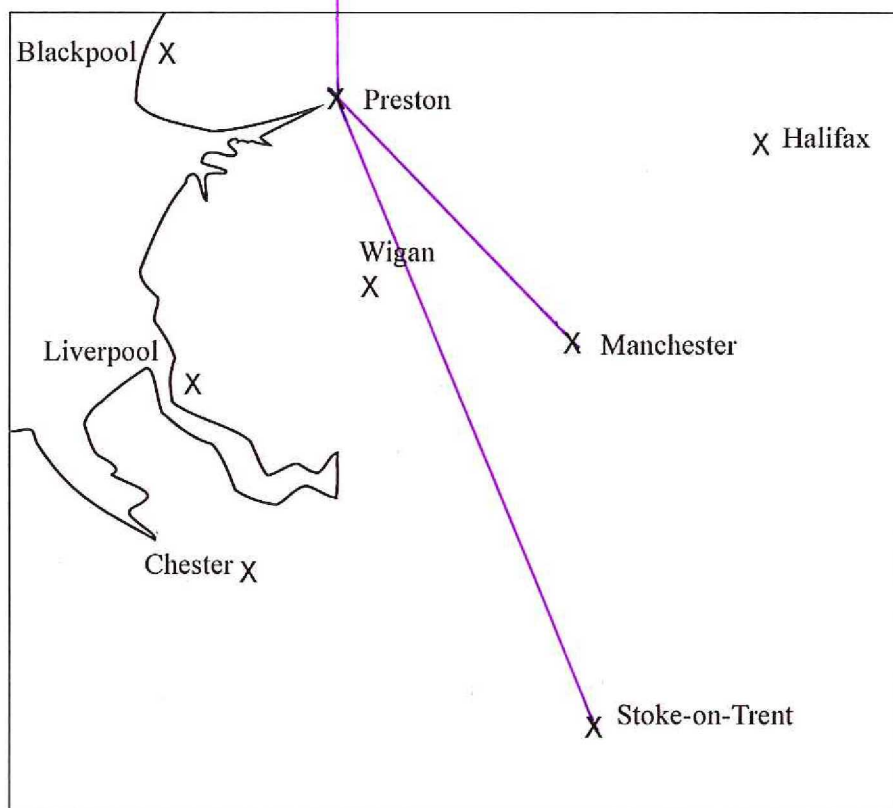
(4 marks)

- b What is the size of angle BDA?

90° (A1)
 (1 mark)

(Total: 5 marks)

7. This is a map of part of Northern England.



Scale: 1 cm represents 10 km

A plane flies in a straight line from Preston to Stoke-on-Trent.

- (a) How far does it fly?
Give your answer in kilometres.

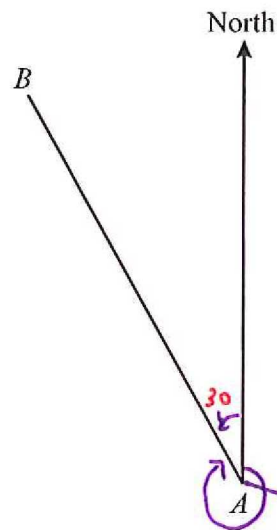
9 cm (B1) [8.8 cm - 9.2 cm] Accept
9 cm $\times 10 = 90$ km

90 (A1) [88 km - 92 km] Accept
..... km (2 marks)

- (b) Measure and write down the bearing of Manchester from Preston.

136 (A1) [134° - 138°] Accept
.....° (1 mark)
(Total: 3 marks)

8.



- (a) Measure and write down the bearing of B from A .

$$= 360 - 30 \text{ (M1)}$$

$$= 330^\circ$$

Alternative (M1) for $180 + 150 = 330^\circ$

330 $^\circ$ [328 $^\circ$ - 332 $^\circ$]
(2 marks)

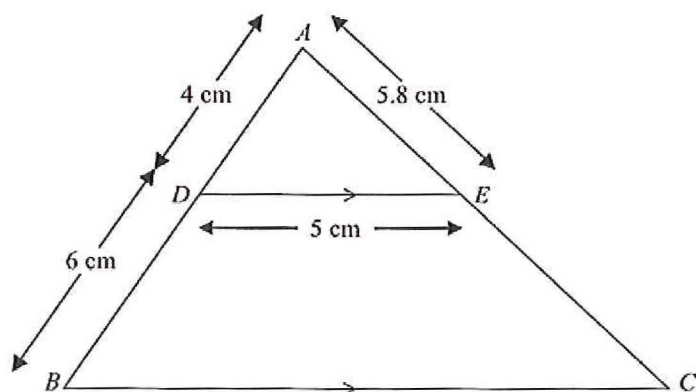
- (b) On the diagram, draw a line on a bearing of 107° from A .

On diagram.

(1 mark)
(Total: 3 marks)

9. ABC is a triangle

Diagram NOT accurately drawn



D is a point on AB and E is a point on AC .

DE is parallel to BC .

$AD = 4$ cm, $DB = 6$ cm, $DE = 5$ cm, $AE = 5.8$ cm.

Calculate the perimeter of the trapezium $DBCE$.

(B1) Scale factor calculation.

$$BC = \frac{10}{4} \times 5$$

$= 12.5$ cm (M1) Calculates BC

$$EC = AC - AE$$

$$= \frac{10}{4} \times 5.8 - 5.8$$

$= 8.7$ cm (M1) Calculates EC

(A1)

$$\text{Perimeter} = 6 + 12.5 + 8.7 + 5 = 32.2 \text{ cm.}$$

(Total:4 marks)

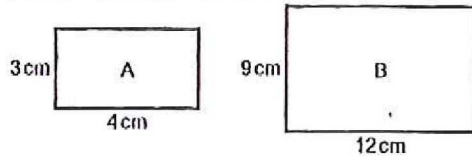
END OF TEST

Overall mark: /45

Challenge question:

Investigation

1 Are these rectangles similar?



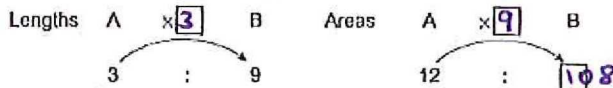
Does $\frac{12}{4} = \frac{9}{3}$?

$3 = 3$ ✓ yes. ∴ similar

2 Write the ratio of their lengths and their areas.

3 What is the scale factor? for length? $\times 3$

4 What is the area factor? $\times 9$.



5 Draw five pairs of other similar rectangles. Copy and complete this table.

Length	Width	Ratio of lengths	Scale factor	Ratio of areas	Area factor

6 Can you see a pattern between the area factor and the scale factor?

7 Repeat the investigation for right-angled triangles.

Repeated.



Students should conclude that, if the scale factor for length of 2 given rectangles is k , then their area (scale) factor will be k^2 .