

Name: \_\_\_\_\_

GCSE (1 – 9)

Similar Shapes

### Instructions

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

### Information

- The marks for each question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

1.

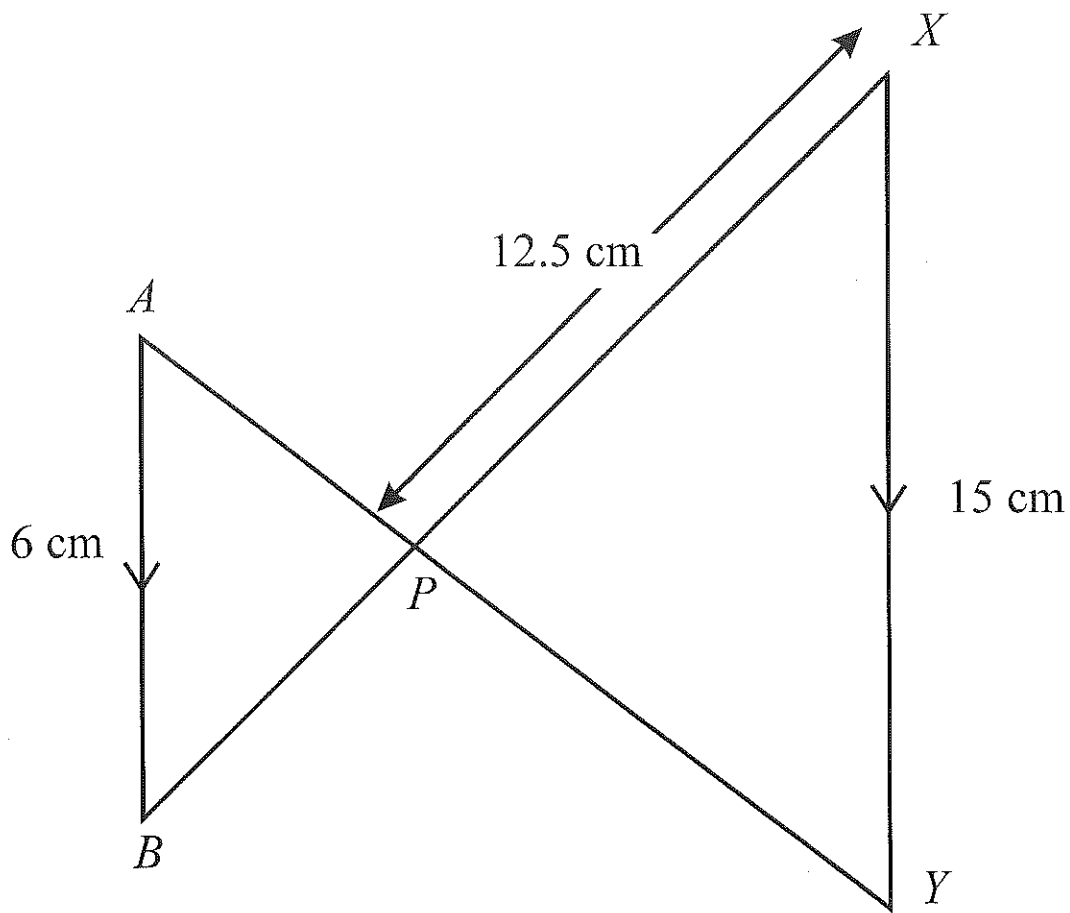


Diagram NOT accurately drawn

AB is parallel to XY.

The lines AY and BX intersect at P.

AB = 6 cm.

XP = 12.5 cm.

XY = 15 cm.

$$\text{Scale factor} = \frac{15}{6} = \frac{5}{2} = 2.5$$

Work out the length of BP.

$$\frac{12.5}{2.5} = 5$$

.....5..... cm (3)

2.

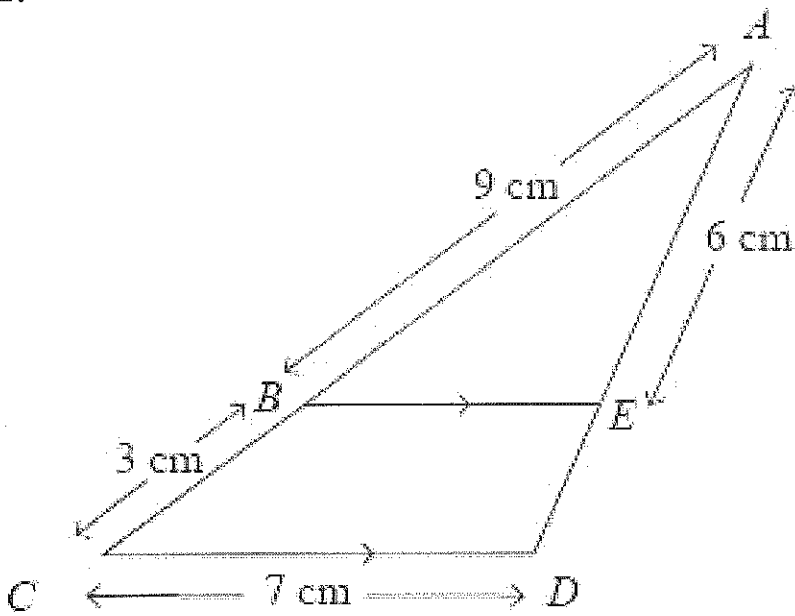
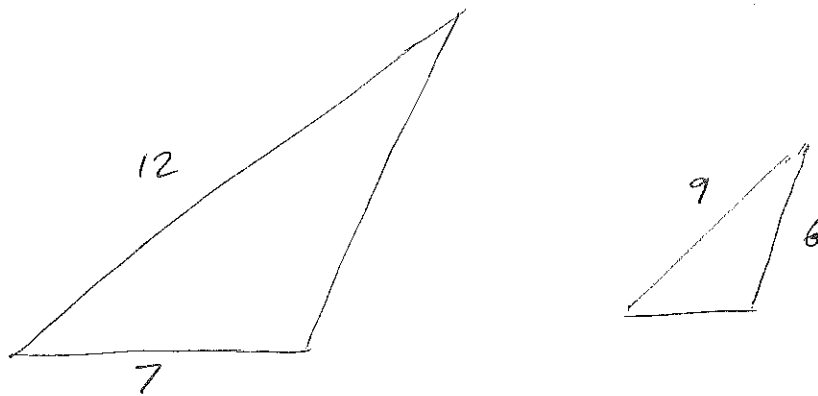


Diagram NOT accurately drawn



BE is parallel to CD.

AB = 9 cm, BC = 3 cm, CD = 7 cm, AE = 6 cm.

Scale factor  $\frac{12}{9} = \frac{4}{3}$

(a) Calculate the length of ED.

$$2 \times \frac{4}{3} = 8$$

.....2..... cm (2)

(b) Calculate the length of BE.

$$7 \div \frac{4}{3}$$

.....5.25..... cm (2)

$$7 \times \frac{3}{4} = \frac{21}{4}$$

3.

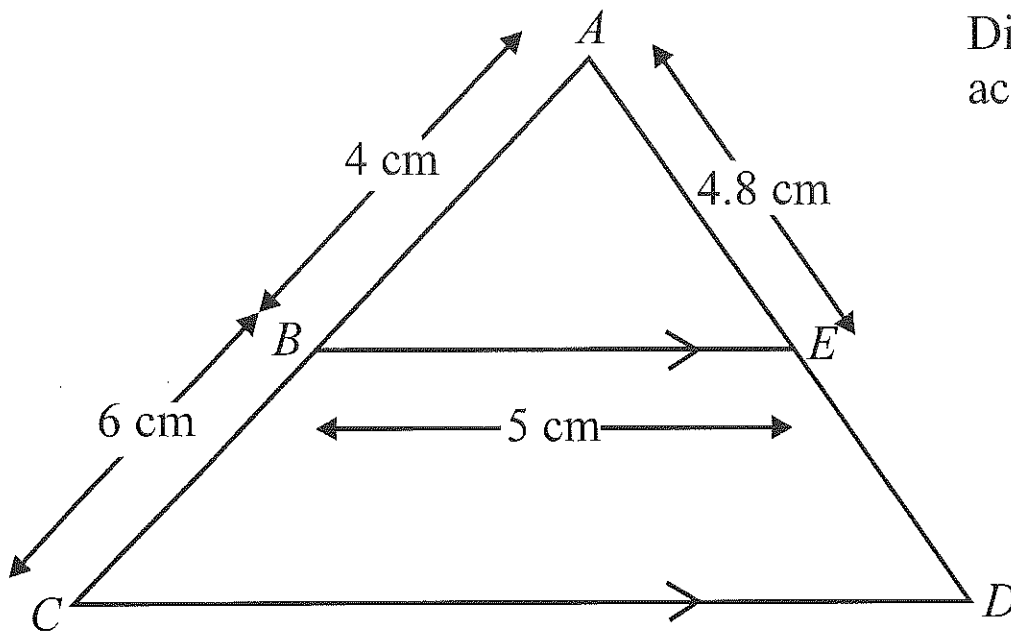


Diagram **NOT** accurately drawn

BE is parallel to CD.

ABC and AED are straight lines.

AB = 4 cm, BC = 6 cm, BE = 5 cm, AE = 4.8 cm.

$$\text{Scale factor} = \frac{10}{4} = \frac{5}{2} = 2.5$$

(a) Calculate the length of CD.

$$5 \times 2.5$$

$$\dots 12.5 \dots \text{cm} \quad (2)$$

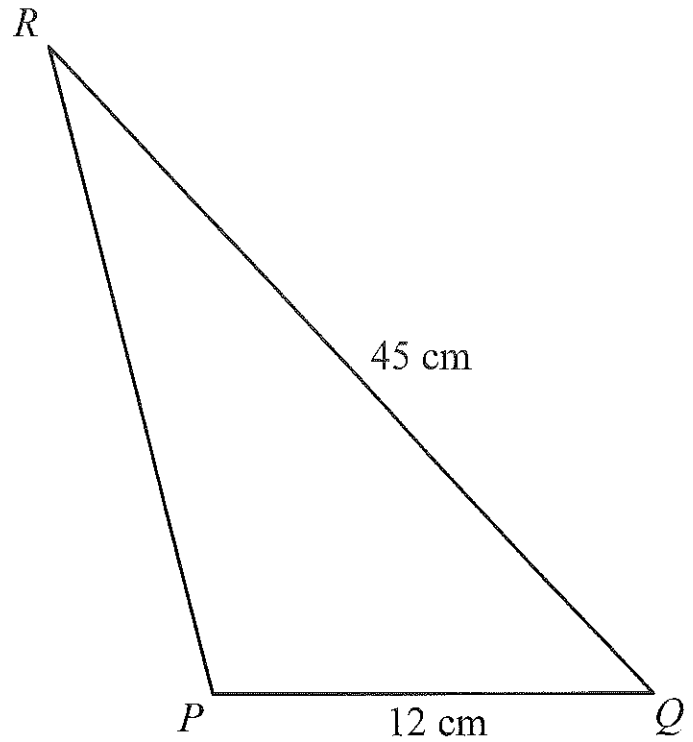
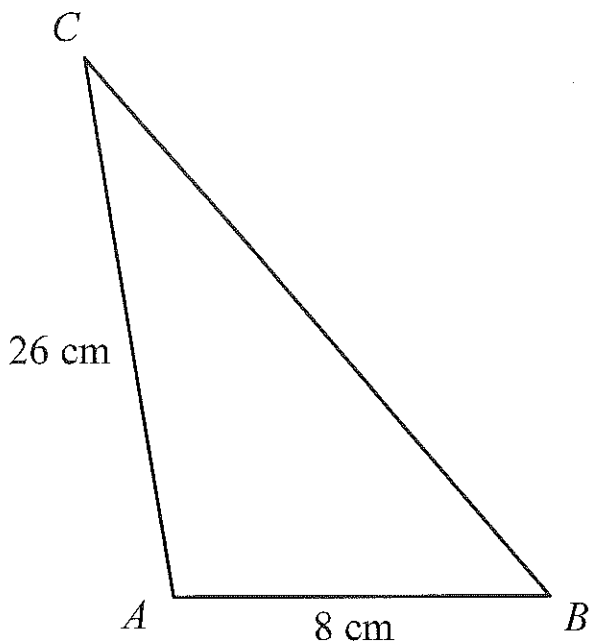
(b) Calculate the length of ED.

$$4.8 \times 2.5 = 12$$

$$\dots 7.2 \dots \text{cm} \quad (2)$$

$$12 - 4.8 = 7.2$$

4.



The two triangles ABC and PQR are mathematically similar.

Angle A = angle P.

Angle B = angle Q.

AB = 8 cm.

AC = 26 cm.

PQ = 12 cm.

QR = 45 cm.

$$\text{Scale factor} = \frac{45}{26} \cdot \frac{12}{8} = \frac{3}{2} = 1.5$$

(a) Calculate the length of PR.

$$26 \times 1.5$$

$$\dots 39 \dots \text{cm} \quad (2)$$

(b) Calculate the length of BC.

$$45 \div 1.5$$

$$\dots 30 \dots \text{cm} \quad (2)$$

5.

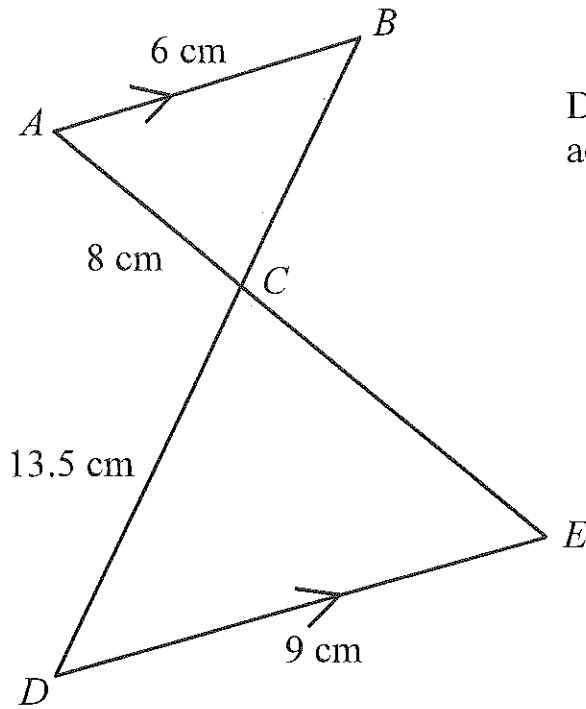


Diagram **NOT**  
accurately drawn

AB is parallel to DE.

ACE and BCD are straight lines.

AB = 6 cm,

AC = 8 cm,

CD = 13.5 cm,

DE = 9 cm.

$$\text{Scale factor} = \frac{9}{6} = 1.5$$

(a) Calculate the length of CE.

$$8 \times 1.5$$

$$\dots 12 \dots \text{cm} \quad (2)$$

(b) Calculate the length of BC.

$$13.5 \div 1.5$$

$$\dots 9 \dots \text{cm} \quad (2)$$

6.

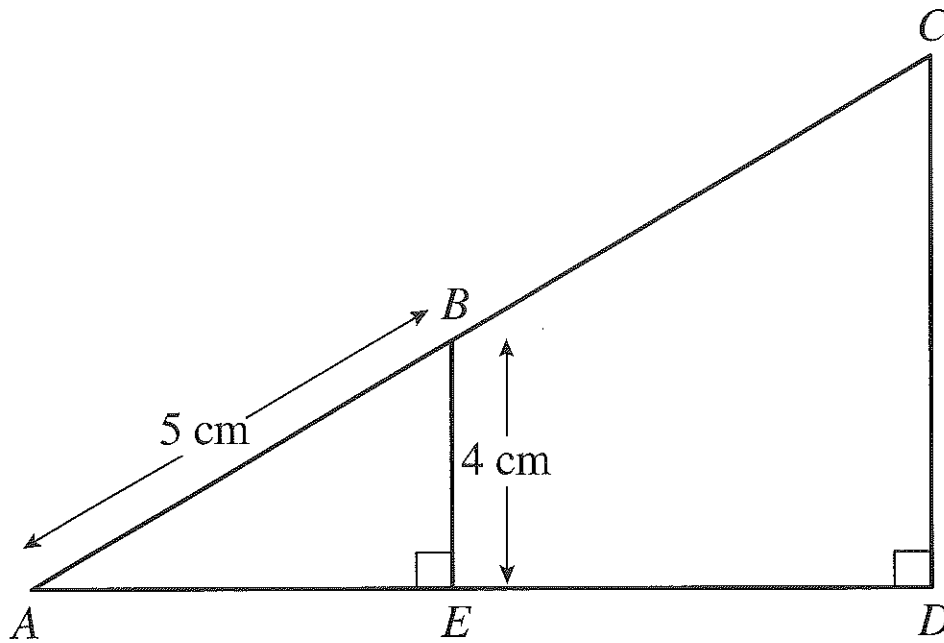


Diagram **NOT** accurately drawn

$$AB: AC = 1: 3$$

↑  
Scale factor 3

(a) Calculate the length of CD.

$$4 \times 3$$

.....12.....cm (2)

(b) Calculate the length of BC.

$$5 \times 3 = 15$$

$$15 - 5$$

.....10.....cm (2)

7.



A 20 Euro note is a rectangle 133 mm long and 72 mm wide.

A 500 Euro Note is a rectangle 160 mm long and 82 mm wide.

Show that the two rectangles are not mathematically similar.

$$\text{length: } \frac{160}{133} = 1.203 \text{ (3dp)}$$

$$\text{width: } \frac{82}{72} = 1.139 \text{ (3dp)}$$

The scale for length and width are not the same.

(3)