

SIMILAR SHAPES

[ESTIMATED TIME: 75 minutes]

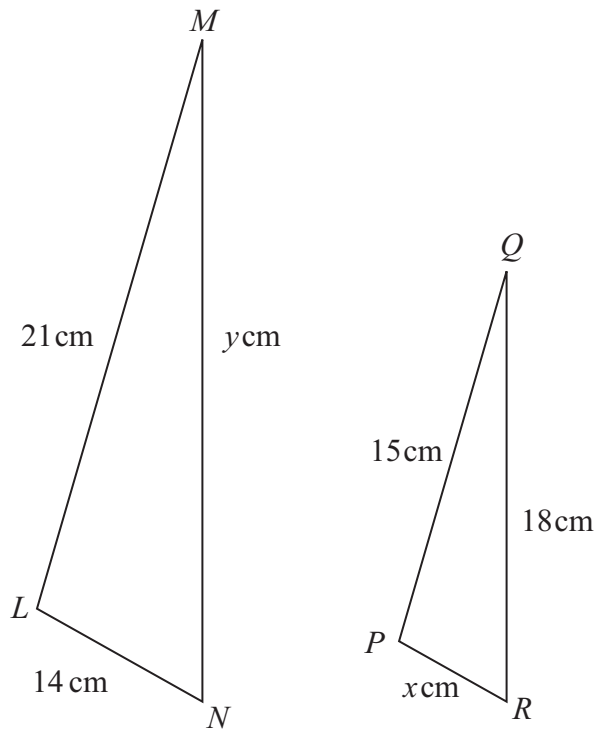
GCSE

(+ IGCSE) EXAM QUESTION PRACTICE

1.

[4 marks]

Here are two similar triangles.



Diagrams **NOT**
accurately drawn

LM corresponds to PQ .
 MN corresponds to QR .

(a) Find the value of x .

$$x = \dots\dots\dots$$

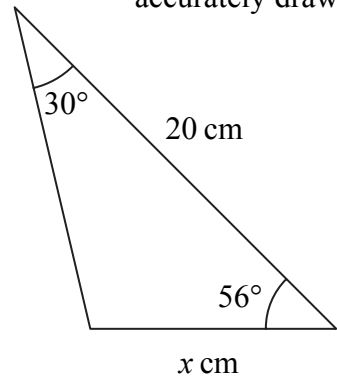
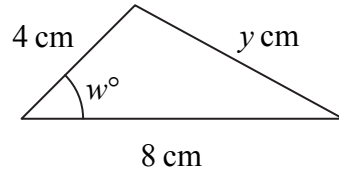
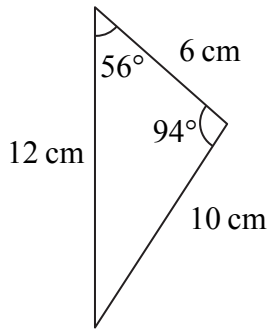
(2)

(b) Find the value of y .

$$y = \dots\dots\dots$$

(2)

Here are three similar triangles.



Find the value of

(a) w ,

$$w = \dots\dots\dots (1)$$

(b) x ,

$$x = \dots\dots\dots (2)$$

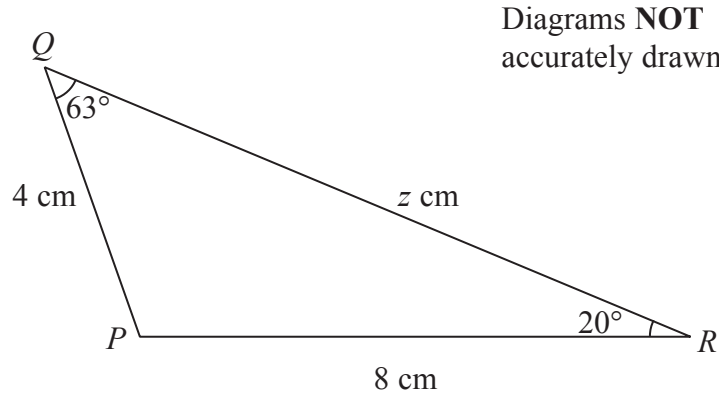
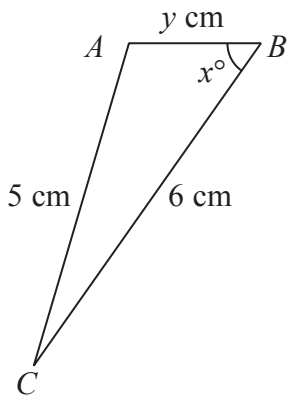
(c) y .

$$y = \dots\dots\dots (2)$$

Here are two similar triangles.

AB corresponds to PQ .

BC corresponds to QR .



Diagrams **NOT**
accurately drawn

Find the value of

(a) x

$$x = \dots\dots\dots \quad \mathbf{(1)}$$

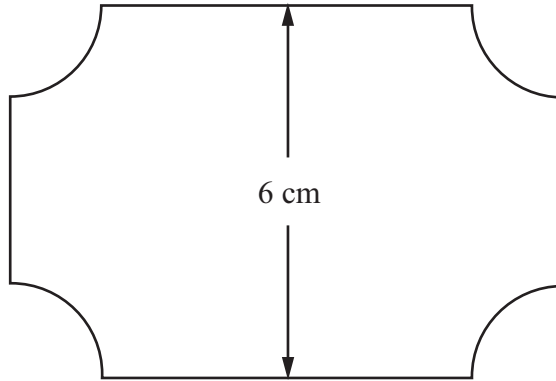
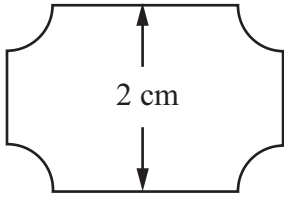
(b) y

$$y = \dots\dots\dots \quad \mathbf{(2)}$$

(c) z

$$z = \dots\dots\dots \quad \mathbf{(2)}$$

Here are two supermarket price tickets.



Diagrams **NOT**
accurately drawn

The two supermarket price tickets are mathematically similar.

The area of the smaller ticket is 7 cm^2 .

Calculate the area of the larger ticket.

..... cm^2

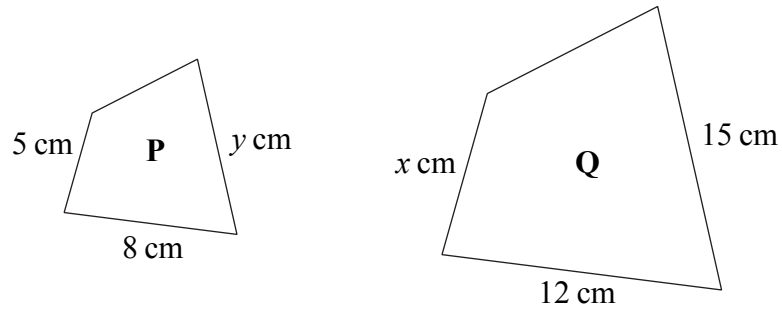


Diagram **NOT**
accurately drawn

Quadrilateral **P** is mathematically similar to quadrilateral **Q**.

(a) Calculate the value of x .

$$x = \dots\dots\dots$$

(2)

(b) Calculate the value of y .

$$y = \dots\dots\dots$$

(2)

The area of quadrilateral **P** is 60 cm^2 .

(c) Calculate the area of quadrilateral **Q**.

$$\dots\dots\dots \text{ cm}^2$$

(2)

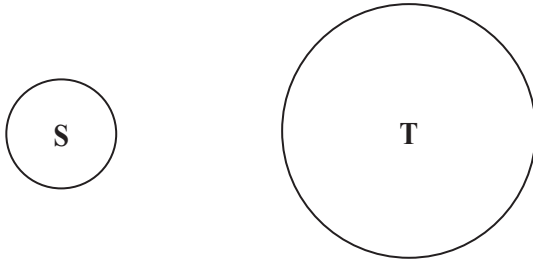


Diagram **NOT**
accurately drawn

The area of circle **S** is 4 cm^2 .

The radius of circle **T** is 3 times the radius of circle **S**.

Work out the area of circle **T**.

..... cm^2

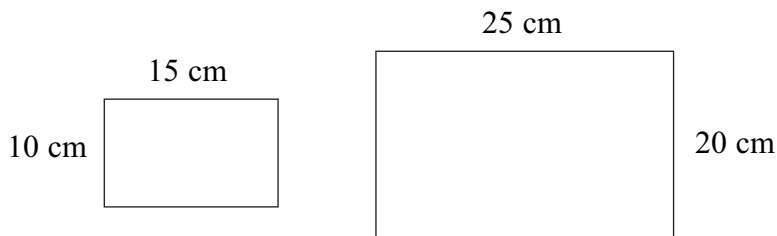


Diagram **NOT**
accurately drawn

Are the two rectangles mathematically similar?

Tick (✓) the appropriate box.

You must show working to justify your answer.

Yes

No

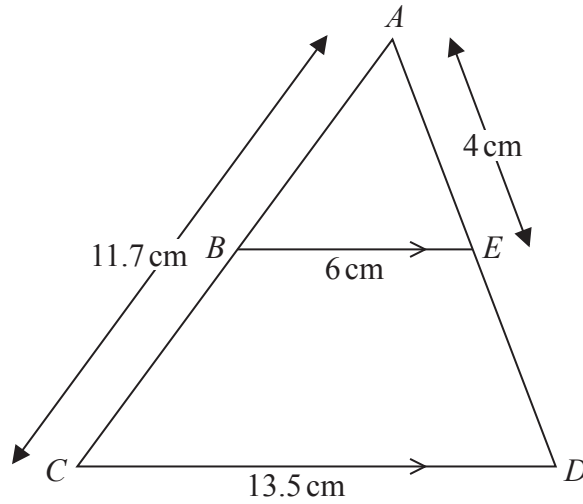


Diagram **NOT**
accurately drawn

The diagram shows triangle ACD .

B is a point on AC and E is a point on AD so that BE is parallel to CD .

$$AE = 4 \text{ cm}$$

$$AC = 11.7 \text{ cm}$$

$$BE = 6 \text{ cm}$$

$$CD = 13.5 \text{ cm}$$

(a) Calculate the length of AB .

..... cm
(2)

(b) Calculate the length of ED .

..... cm
(2)

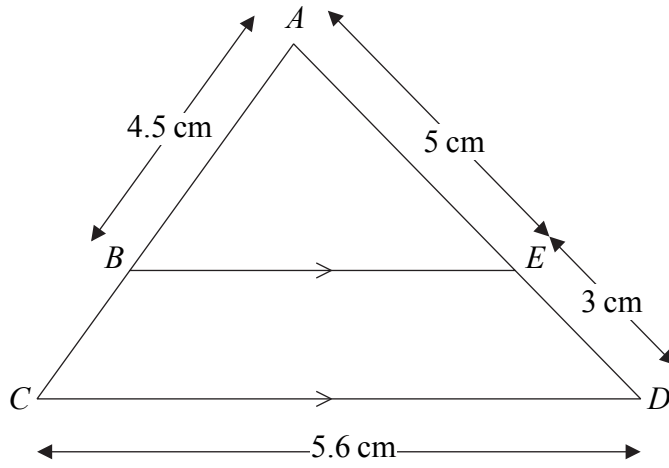


Diagram **NOT**
accurately drawn

BE is parallel to CD .

$AB = 4.5$ cm, $AE = 5$ cm, $ED = 3$ cm, $CD = 5.6$ cm.

(a) Calculate the length of BE .

..... cm
(2)

(b) Calculate the length of BC .

..... cm
(2)

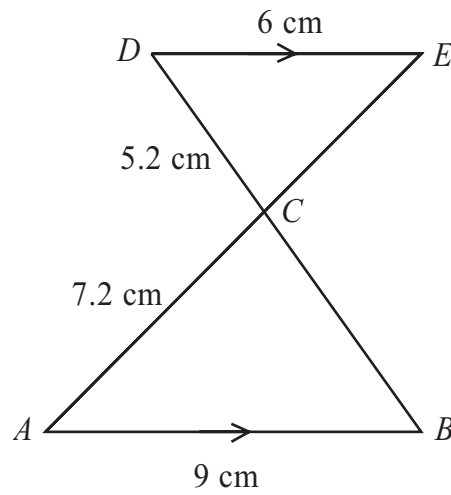


Diagram **NOT**
accurately drawn

AB is parallel to DE .

ACE and BCD are straight lines.

$AB = 9$ cm.

$AC = 7.2$ cm.

$CD = 5.2$ cm.

$DE = 6$ cm.

(a) Calculate the length of BC .

..... cm

(2)

(b) Calculate the length of CE .

..... cm

(2)

$ABCD$ and $APQR$ are two similar quadrilaterals.

- $PQ = 9$ cm.
- $BC = 6$ cm.
- $AD = 5$ cm.
- $QR = 12$ cm.

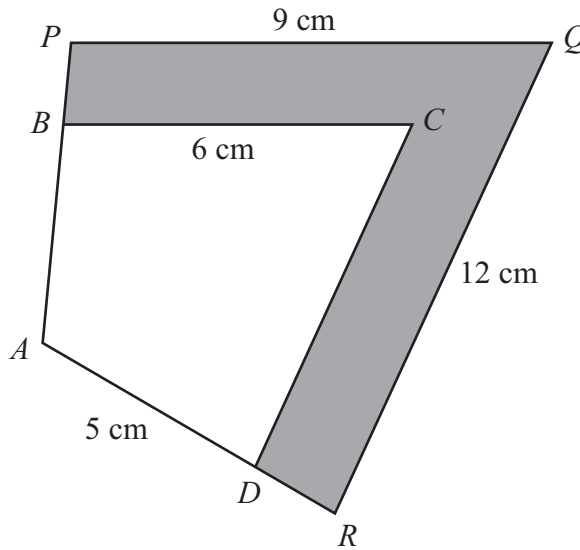


Diagram **NOT** accurately drawn

(a) Find the length of DC .

..... cm
(2)

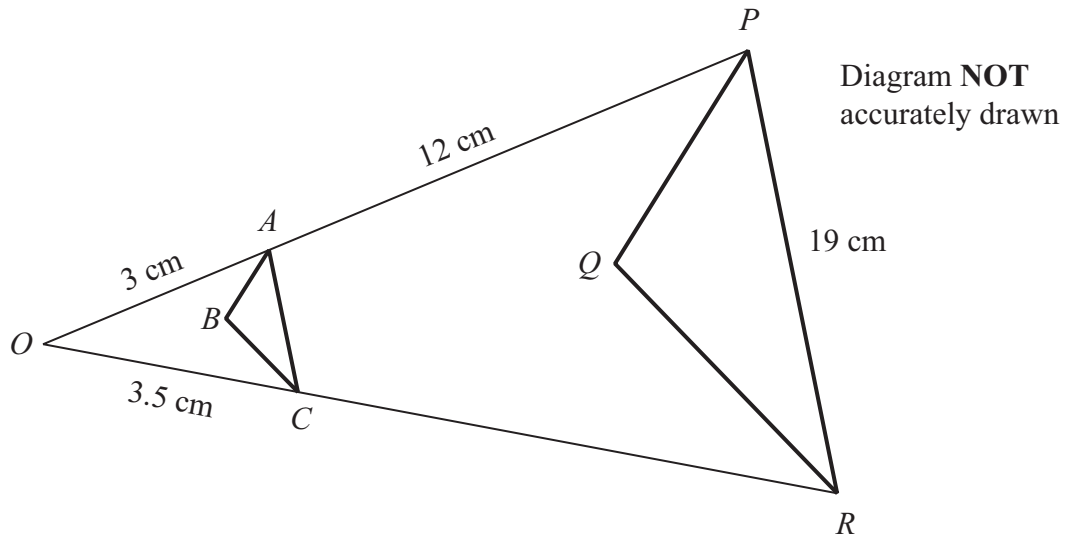
(b) Find the length of AR .

..... cm
(2)

The area of the quadrilateral $ABCD$ is 32 cm².

(c) Calculate the area of the shaded region.

..... cm²
(3)



Triangle PQR is an enlargement, centre O , of triangle ABC .

OAP and OCR are straight lines.

$OA = 3$ cm.

$AP = 12$ cm.

$OC = 3.5$ cm.

$PR = 19$ cm.

(a) Work out the length of CR .

..... cm

(2)

(b) Work out the length of AC .

..... cm

(3)

The area of triangle ABC is 2 cm²

(c) Work out the area of triangle PQR .

..... cm²

(2)

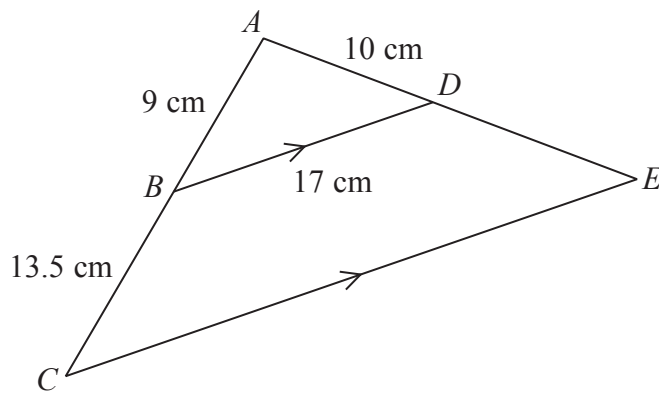


Diagram **NOT**
accurately drawn

In the diagram ABC and ADE are straight lines.

BD is parallel to CE .

$AB = 9$ cm, $BC = 13.5$ cm, $AD = 10$ cm, $BD = 17$ cm

(a) Calculate the length of CE .

..... cm
(2)

(b) Calculate the length of DE .

..... cm
(2)

The area of triangle ABD is 36 cm²

(c) Calculate the area of quadrilateral $BDEC$.

..... cm²
(3)

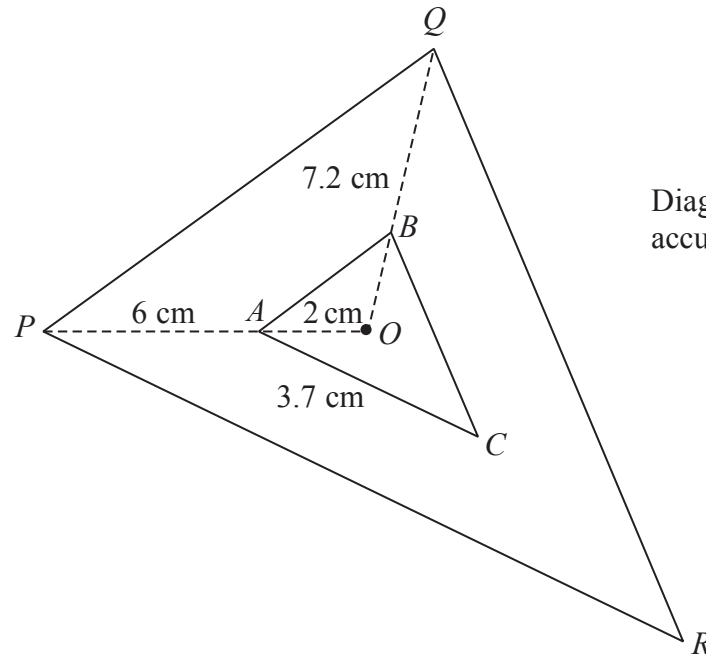


Diagram **NOT**
accurately drawn

Triangle PQR is an enlargement, centre O , of triangle ABC .

OAP and OBQ are straight lines.

$OA = 2$ cm.

$AP = 6$ cm.

$BQ = 7.2$ cm.

$AC = 3.7$ cm.

(a) Work out the length of OB .

..... cm

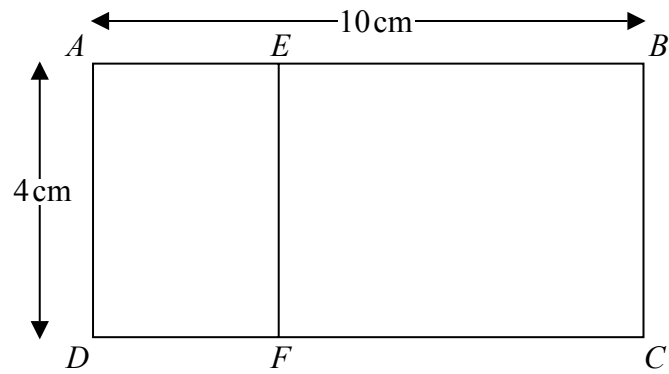
(2)

(b) Work out the length of PR .

..... cm

(3)

Rectangle $ABCD$ is mathematically similar to rectangle $DAEF$.



$$AB = 10\text{ cm.}$$

$$AD = 4\text{ cm.}$$

Work out the area of rectangle $DAEF$.

..... cm^2

The diagram shows two regular hexagons, $OABCDE$ and $FGHIJ$.

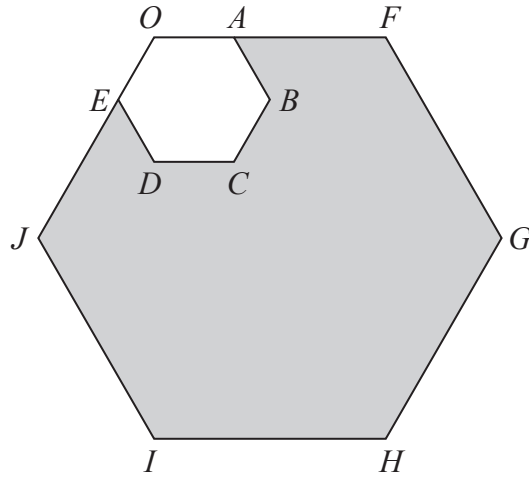


Diagram **NOT**
accurately drawn

OAF and OEJ are straight lines.

$OF = 3 OA$.

The area of $OABCDE$ is 4 cm^2 .

Calculate the area of the shaded region.

..... cm^2

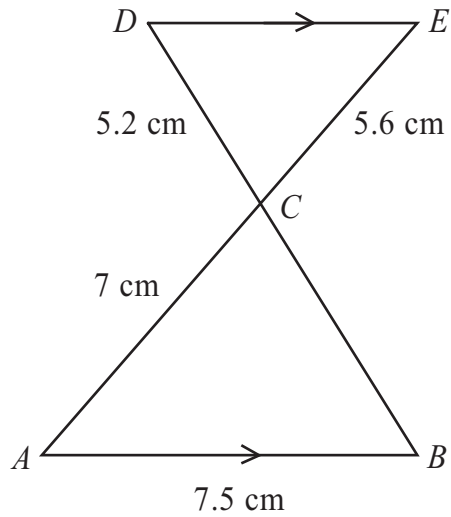


Diagram **NOT**
accurately drawn

AB is parallel to DE .

The lines AE and BD intersect at C .

$AB = 7.5$ cm, $AC = 7$ cm, $CD = 5.2$ cm, $CE = 5.6$ cm.

(a) Calculate the length of BC .

..... cm
(2)

(b) Calculate the length of DE .

..... cm
(2)

(c) The area of triangle ABC is 21 cm²
Calculate the area of triangle EDC .

..... cm²
(3)