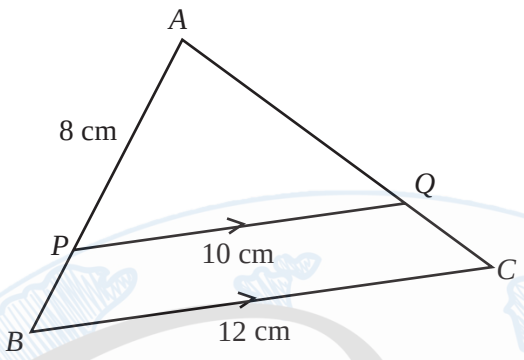
Similarity

9

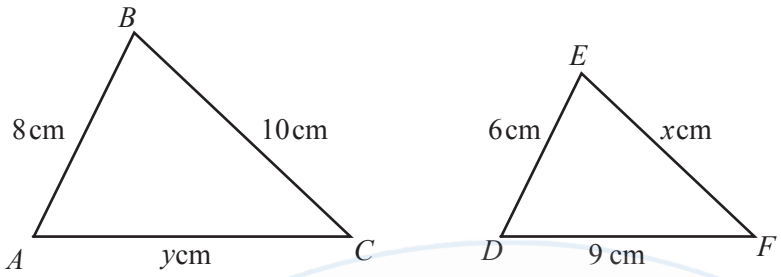


NOT TO SCALE

APB and *AQC* are straight lines. *PQ* is parallel to *BC*
AP = 8 cm, *PQ* = 10 cm and *BC* = 12 cm.
Calculate the length of *AB*

Answer AB = ... cm [2]

19



NOT TO SCALE

Triangle ABC is similar to triangle DEF

Calculate the value of

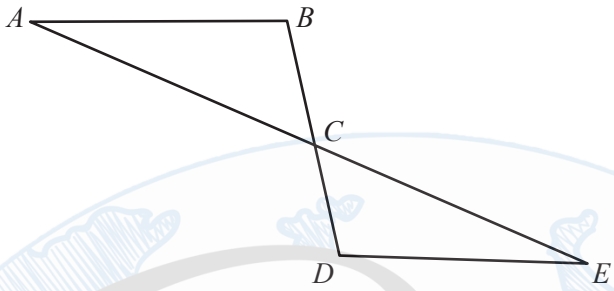
(a) x,

Answer(a) x = ... [2]

(b) y

Answer(b) y = ... [2]

7



NOT TO SCALE

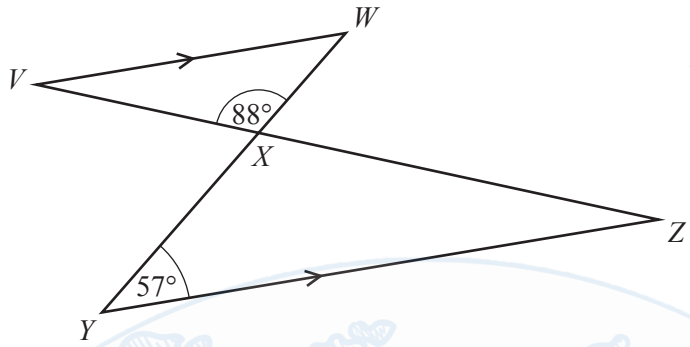
The diagram shows two straight lines, AE and BD, intersecting at C.
Angle ABC = angle EDC.
Triangles ABC and EDC are congruent.

Write down **two** properties of line segments AB and DE.

Answer AB and DE are .....

and ..... [2]

20 (a)



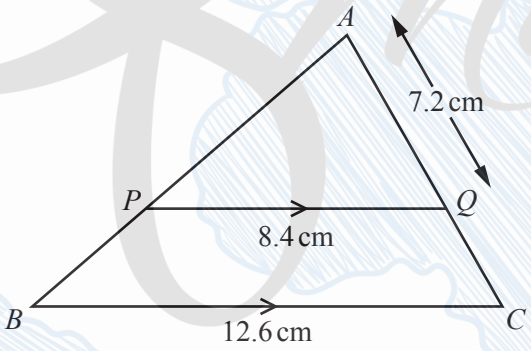
NOT TO SCALE

Two straight lines VZ and YW intersect at X.
VW is parallel to YZ, angle $XYZ = 57°$ and angle $VXW = 88°$.

Find angle WVX.

Answer(a) Angle WVX = ... [2]

(b)



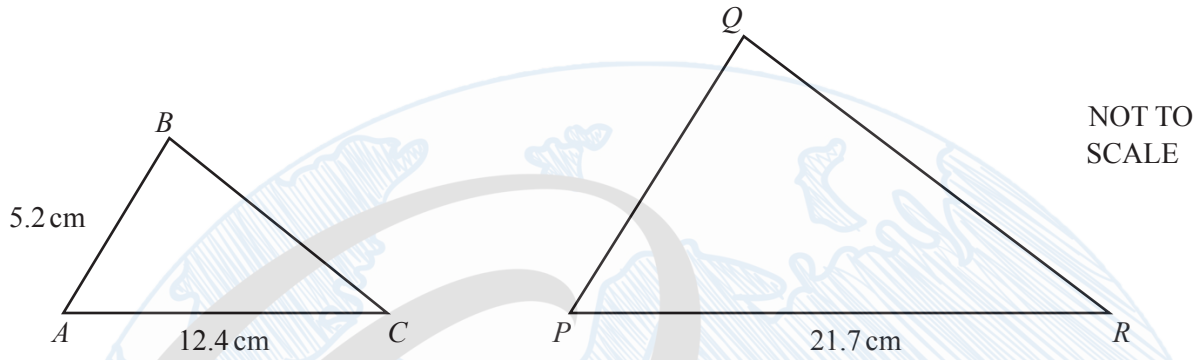
NOT TO SCALE

ABC is a triangle and PQ is parallel to BC.
$BC = 12.6$ cm, $PQ = 8.4$ cm and $AQ = 7.2$ cm.

Find AC.

Answer(b) AC = ... cm [2]

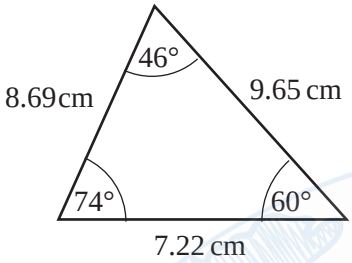
5 Triangle ABC is similar to triangle PQR.

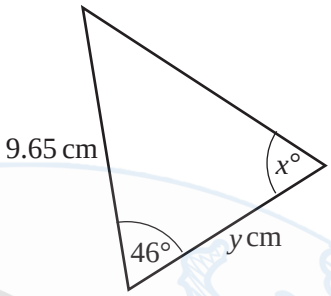


Find PQ

PQ = ... cm [2]

7





NOT TO SCALE

These two triangles are congruent.
Write down the value of

(a) x,

Answer(a) x = ... [1]

(b) y.

Answer(b) y = ... [1]

19 A model of a car is made to a scale of 1 : 40.
The volume of the model is 45 cm^3
Calculate the volume of the car.
Give your answer in m^3

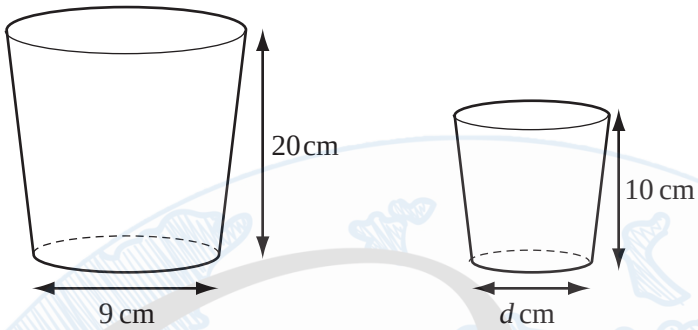
Answer m^3 [3]

11 The volume of a solid varies directly as the **cube** of its length.
When the length is 3 cm, the volume is 108 cm^3.

Find the volume when the length is 5 cm.

Answer ..... cm^3 [3]

17



NOT TO SCALE

The diagrams show two mathematically similar containers.
The larger container has a base with diameter 9 cm and a height 20 cm.
The smaller container has a base with diameter d cm and a height 10 cm.

(a) Find the value of d.

Answer(a) $d =$ ..... [1]

(b) The larger container has a capacity of 1600 ml.

Calculate the capacity of the smaller container.

Answer(b) ..... ml [2]

10) June 2012 V2

8 A car company sells a scale model $\frac{1}{10}$ of the size of one of its cars.

Complete the following table.

	Scale Model	Real Car
Area of windscreen (cm^2)	135	
Volume of storage space (cm^3)		408000

[3]

11) November 2012 V3

15 A model of a ship is made to a scale of $1:200$.
The surface area of the model is $7500\ cm^2$.

Calculate the surface area of the ship, giving your answer in square metres.

Answer ..... m^2 [3]

12

A company sells cereals in boxes which measure 10 cm by 25 cm by 35 cm.

They make a special edition box which is mathematically similar to the original box.

The volume of the special edition box is 15 120 cm^3.

Work out the dimensions of this box.

Answer ..... cm by ..... cm by ..... cm [3]

13) June 2013 V2

9 A car, 4.4 metres long, has a fuel tank which holds 65 litres of fuel when full.
The fuel tank of a mathematically similar model of the car holds 0.05 litres of fuel when full.

Calculate the length of the model car in centimetres.

Answer ..... cm [3]

14) November 2013 V1

11 The volume of a child's model plane is 1200 cm^3.
The volume of the full size plane is 4050 m^3.

Find the scale of the model in the form 1 : *n*.

Answer 1: ..... [3]

6 The volumes of two similar cones are $36\pi\,cm^3$ and $288\pi\,cm^3$.
The base radius of the smaller cone is 3cm.

Calculate the base radius of the larger cone.

Answer ..... cm [3]

18

NOT TO SCALE

The two containers are mathematically similar in shape.
The larger container has a volume of 3456 cm^3 and a surface area of 1024 cm^2.
The smaller container has a volume of 1458 cm^3.

Calculate the surface area of the smaller container.

Answer ..... cm^2 [4]

8 Hans draws a plan of a field using a scale of 1 centimetre to represent 15 metres.
The actual area of the field is $10800\,m^2$.

Calculate the area of the field on the plan.

Answer ..... cm^2 [2]

18

NOT TO SCALE

The two containers are mathematically similar in shape.
The larger container has a volume of 3456 cm^3 and a surface area of 1024 cm^2.
The smaller container has a volume of 1458 cm^3.

Calculate the surface area of the smaller container.

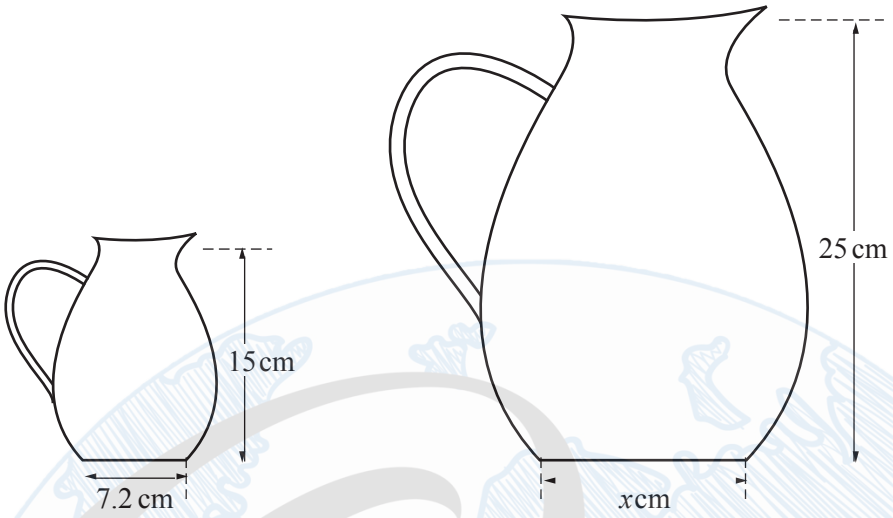
Answer ..... cm^2 [4]

9 The scale on a map is 1 : 50 000.
The area of a field on the map is 1.2 square centimetres.

Calculate the actual area of the field in square kilometres.

Answer ..... km^2 [2]

21 (a)



The diagram shows two jugs that are mathematically similar.

Find the value of x.

Answer(a) x = ... [2]

(b)

The diagram shows two glasses that are mathematically similar.
The height of the larger glass is 16 cm and its volume is 375 cm^3.
The height of the smaller glass is y cm and its volume is 192 cm^3

Find the value of y.

Answer(b) y = ... [3]

14 Two containers are mathematically similar.
Their volumes are 54 cm^3 and 128 cm^3
The height of the smaller container is 4.5 cm.

Calculate the height of the larger container.

Answer ..... cm [3]

10 The scale on a map is 1 : 20 000.
The area of a lake on the map is 1.6 square centimetres.

Calculate the actual area of the lake.
Give your answer in square metres.

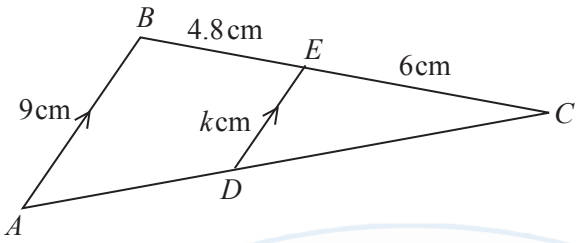
.....m^2 [3]

7 A map is drawn to a scale of 1 : 1 000 000.
A forest on the map has an area of $4.6\,cm^2$.

Calculate the actual area of the forest in square kilometres.

..... km^2 [2]

21 (a)



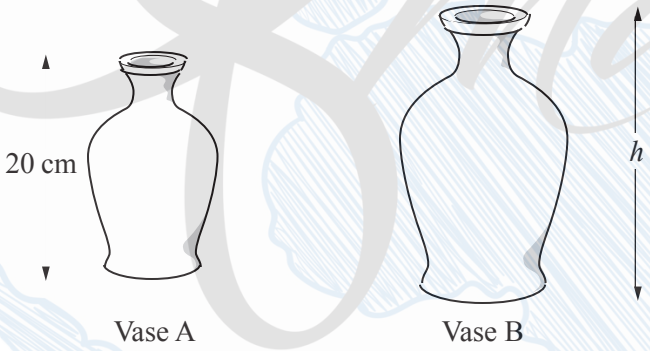
NOT TO SCALE

Triangles CBA and CED are similar
AB is parallel to DE.
$AB = 9$ cm, $BE = 4.8$ cm, $EC = 6$ cm and $ED = k$ cm.

Work out the value of k

$k =$ ..... [2]

(b)



NOT TO SCALE

The diagram shows two mathematically similar vases.
Vase A has height 20 cm and volume 1500cm^3.
Vase B has volume 2592 cm^3.

Calculate h, the height of vase B.

$h =$ ..... cm [3]

25) November 2016 V1

16 Two cups are mathematically similar.
The larger cup has capacity 0.5 litres and height 8 cm.
The smaller cup has capacity 0.25 litres.

Find the height of the smaller cup.

..... cm [3]

26) November 2016 V2

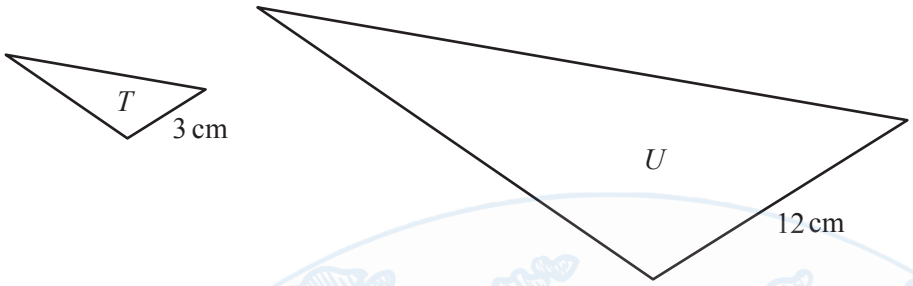
10 The length of a backpack of capacity 30 litres is 53 cm.

Calculate the length of a mathematically similar backpack of capacity 20 litres.

..... cm [3]

27) June 2018 V2

11



NOT TO SCALE

The diagram shows two mathematically similar triangles, T and U.
Two corresponding side lengths are 3 cm and 12 cm.
The area of triangle T is 5 cm^2.

Find the area of triangle U.

..... cm^2 [2]

28) November 2020 V2

20 A model of a statue has a height of 4 cm.
The volume of the model is 12 cm^3.
The volume of the statue is 40 500 cm^3.

Calculate the height of the statue.

..... cm [3]