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MATHEMATIC A

TOPIC- Geometry

SIMILARITY

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15

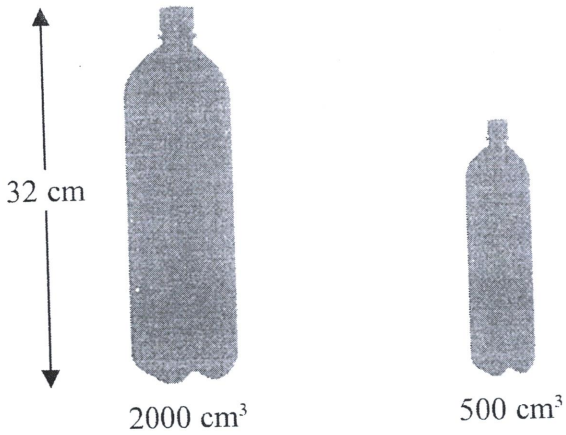


Diagram **NOT** accurately drawn

Zane buys mineral water in large bottles and in small bottles.
The large bottles are mathematically similar to the small bottles.
Large bottles have a height of 32 cm and a volume of 2000 cm^3
Small bottles have a volume of 500 cm^3

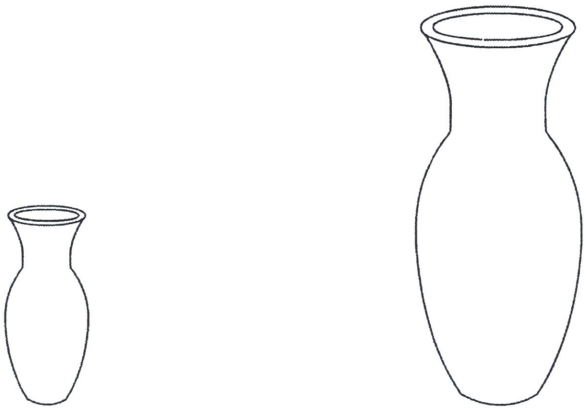
Work out the height of a small bottle.
Give your answer correct to 3 significant figures.

..... cm

(Total for Question 15 is 3 marks)

15 The diagram shows two mathematically similar vases, **A** and **B**.

Diagram **NOT** accurately drawn



A **B**

Vase **A** has a surface area of 120 cm^2
Vase **B** has a surface area of 750 cm^2 and a volume of 1600 cm^3

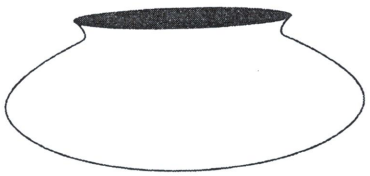
Work out the volume of vase **A**.

..... cm^3

(Total for Question 15 is 3 marks)

16 The diagram shows two mathematically similar pots, **A** and **B**.

A



B

Diagram **NOT** accurately drawn

A has a volume of 264 cm^3
B has a volume of 891 cm^3

A has a height of 8 cm

(a) Work out the height of pot **B**.

..... cm
(2)

B has a surface area of 459 cm^2

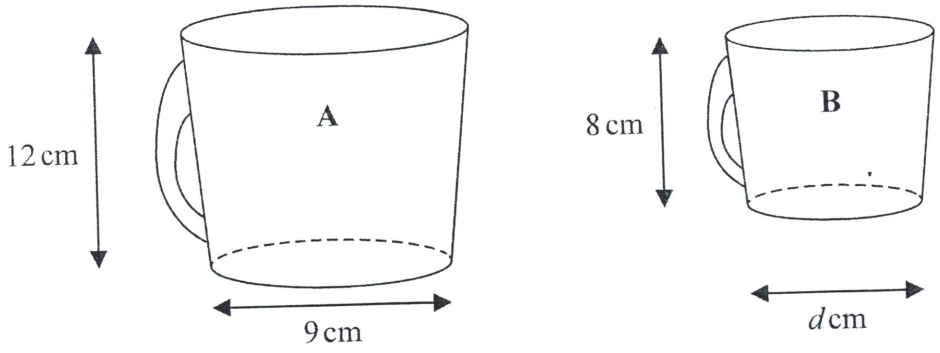
(b) Work out the surface area of pot **A**.

..... cm^2
(2)

(Total for Question 16 is 4 marks)

13 Here are two mathematically similar cups, **A** and **B**.

Diagram **NOT** accurately drawn



A has height 12 cm and base diameter 9 cm.
B has height 8 cm and base diameter d cm.

(a) Work out the value of d.

.....

(2)

The volume of **B** is 160 millilitres.

(b) Work out the volume of **A**.

..... millilitres

(2)

Two solid plates, **P** and **Q**, are mathematically similar and made of the same material.

The surface area of **P** is p cm^2
The surface area of **Q** is q cm^2
The weight of **P** is w grams.

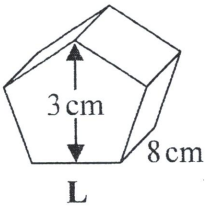
(c) Find an expression for the weight of **Q**.
Give your answer in terms of p, q and w.

..... grams

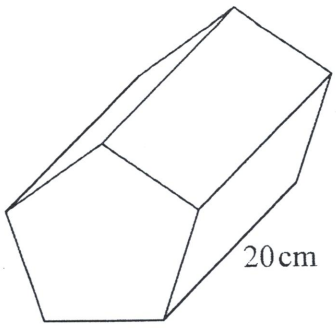
(2)

(Total for Question 13 is 6 marks)

14 **L** and **M** are two mathematically similar prisms.



L



M

Diagram **NOT** accurately drawn

Prism **L** has length 8 cm.
Prism **M** has length 20 cm.

Prism **L** has height 3 cm.

(a) Work out the height of prism **M**.

..... cm

(2)

Prism **M** has a volume of 1875 cm^3

(b) Work out the volume of prism **L**.

..... cm^3

(2)

(Total for Question 14 is 4 marks)

14 *ABCDE* and *AWXYZ* are two mathematically similar pentagons.

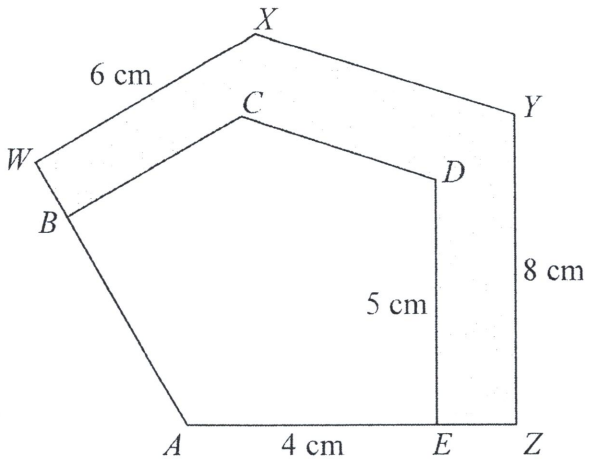


Diagram **NOT** accurately drawn

$AE = 4$ cm $WX = 6$ cm $DE = 5$ cm $YZ = 8$ cm

(a) Calculate the length of AZ.

..... cm

(2)

(b) Calculate the length of BC.

..... cm

(2)

The area of pentagon $AWXYZ$ is 52.48 cm^2

(c) Calculate the area of the shaded region.

..... cm^2

(3)

(Total for Question 14 is 7 marks)

1 The diagram shows triangle ABC.

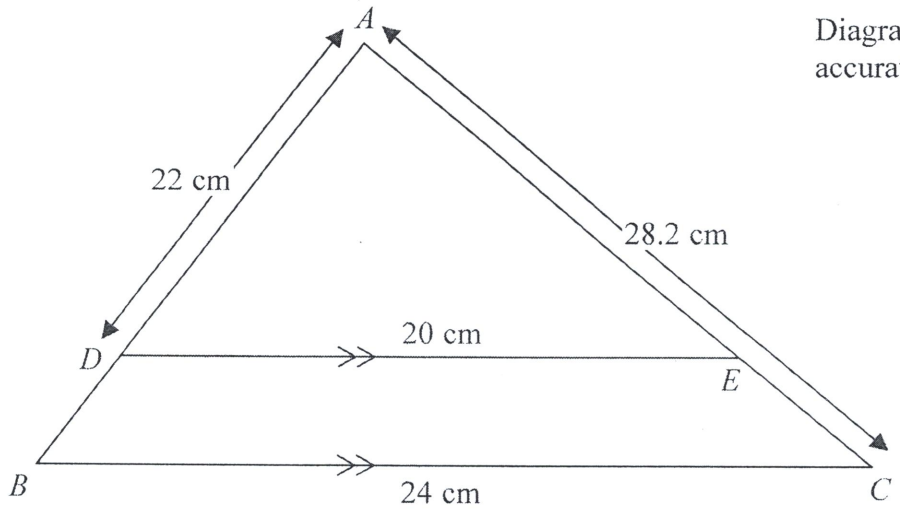


Diagram **NOT** accurately drawn

ADB and AEC are straight lines.
DE is parallel to BC.
$DE = 20$ cm, $BC = 24$ cm, $AD = 22$ cm, $AC = 28.2$ cm

(a) Work out the length of AB.

..... cm
(2)

(b) Work out the length of EC.

..... cm
(2)

(Total for Question 1 is 4 marks)

3

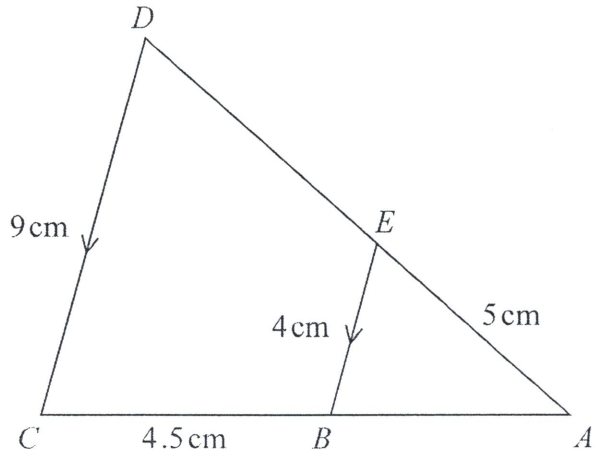


Diagram **NOT** accurately drawn

Triangle ABE is similar to triangle ACD.
AED and ABC are straight lines.
EB and DC are parallel.
$AE = 5\,\text{cm}$, $BC = 4.5\,\text{cm}$, $BE = 4\,\text{cm}$, $CD = 9\,\text{cm}$

(a) Calculate the length of AD.

..... cm

(2)

(b) Calculate the length of AB.

..... cm

(2)

The area of quadrilateral $BCDE$ is $x\,\text{cm}^2$
The area of triangle ABE is $y\,\text{cm}^2$

(c) Find an expression for y in terms of x.
Give your answer as simply as possible.

$y =$ .....

(3)

(Total for Question 3 is 7 marks)

4

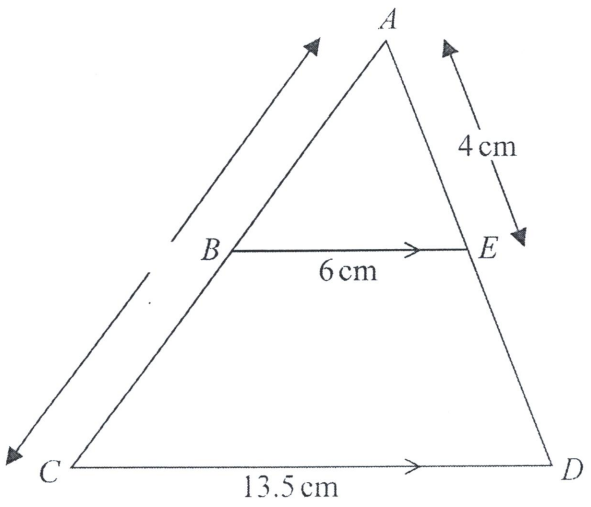


Diagram **NOT** accurately drawn

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)

(Total for Question 4 is 4 marks)

5 Louis makes a model of a plane.

The wingspan of the model is 50 centimetres.
The wingspan of the real plane is 80 metres.

(a) Work out the scale of the model.
Give your answer in the form 1: n

1: .....

(2)

The length of the real plane is 72 metres.

(b) Work out the length of the model.
Give your answer in centimetres.

..... centimetres

(2)

(Total for Question 5 is 4 marks)