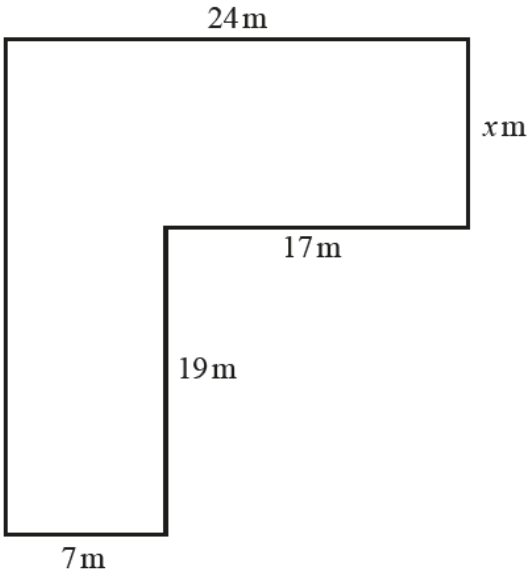
Mensuration – 2020 IGCSE 0580

1. Nov/2020/Paper_11/No.6



NOT TO SCALE

The diagram shows a shape made from rectangles.
The shape has a total area of $517\,m^2$.

Find the value of x.

PapaCambridge

$x =$ ..... [4]

2. Nov/2020/Paper_11/No.19

A circle has a circumference of 56 mm.

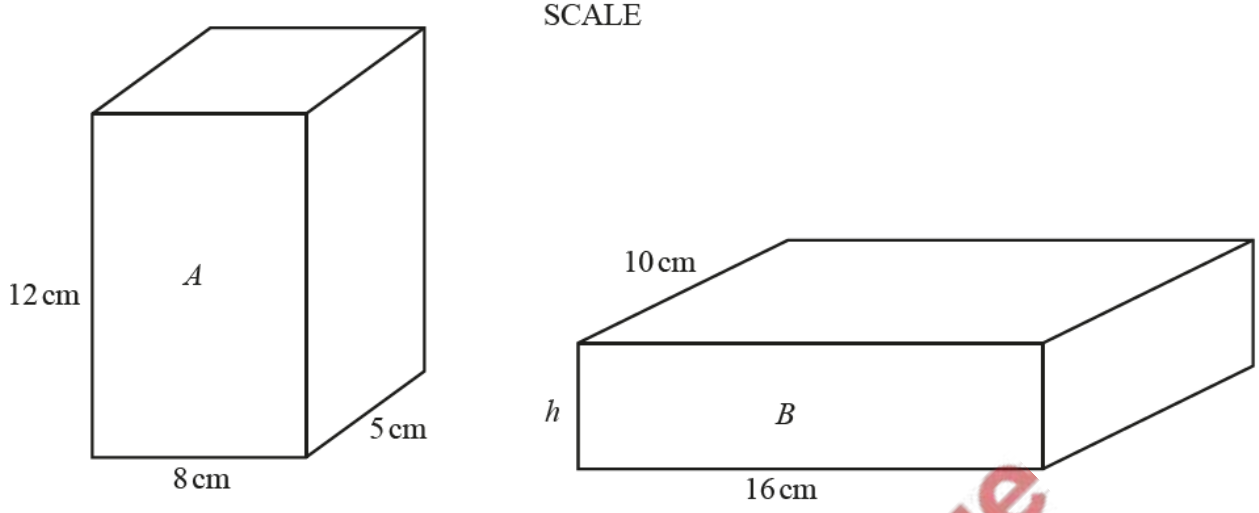
Work out the radius of this circle.

..... mm [2]

PapaCambridge

3. Nov/2020/Paper_12/No.11

NOT TO SCALE



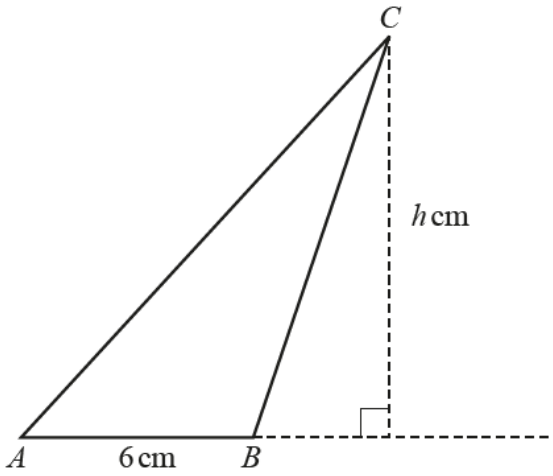
The diagram shows cuboid A and cuboid B.
Cuboid A has the same volume as cuboid B.

Calculate the height, h, of cuboid B.

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

PapaCambridge

4. Nov/2020/Paper_12/No.15



NOT TO SCALE

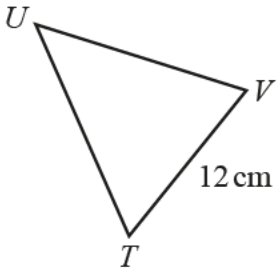
The area of triangle ABC is $27\,\text{cm}^2$ and $AB = 6\,\text{cm}$.

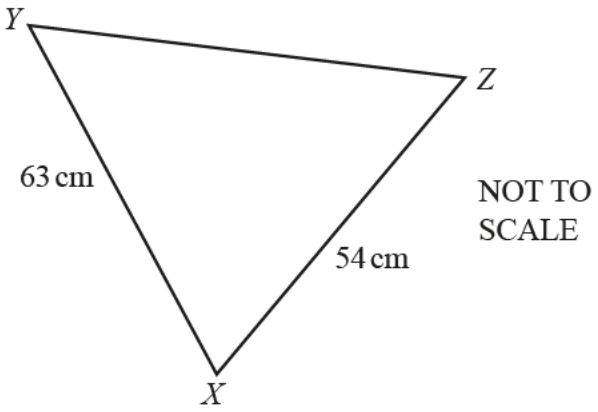
Calculate the value of h.

$h =$ ..... [2]

PapaCambridge

5. Nov/2020/Paper_12/No.23





NOT TO SCALE

The diagram shows two similar triangles TUV and XYZ.

Calculate UT.

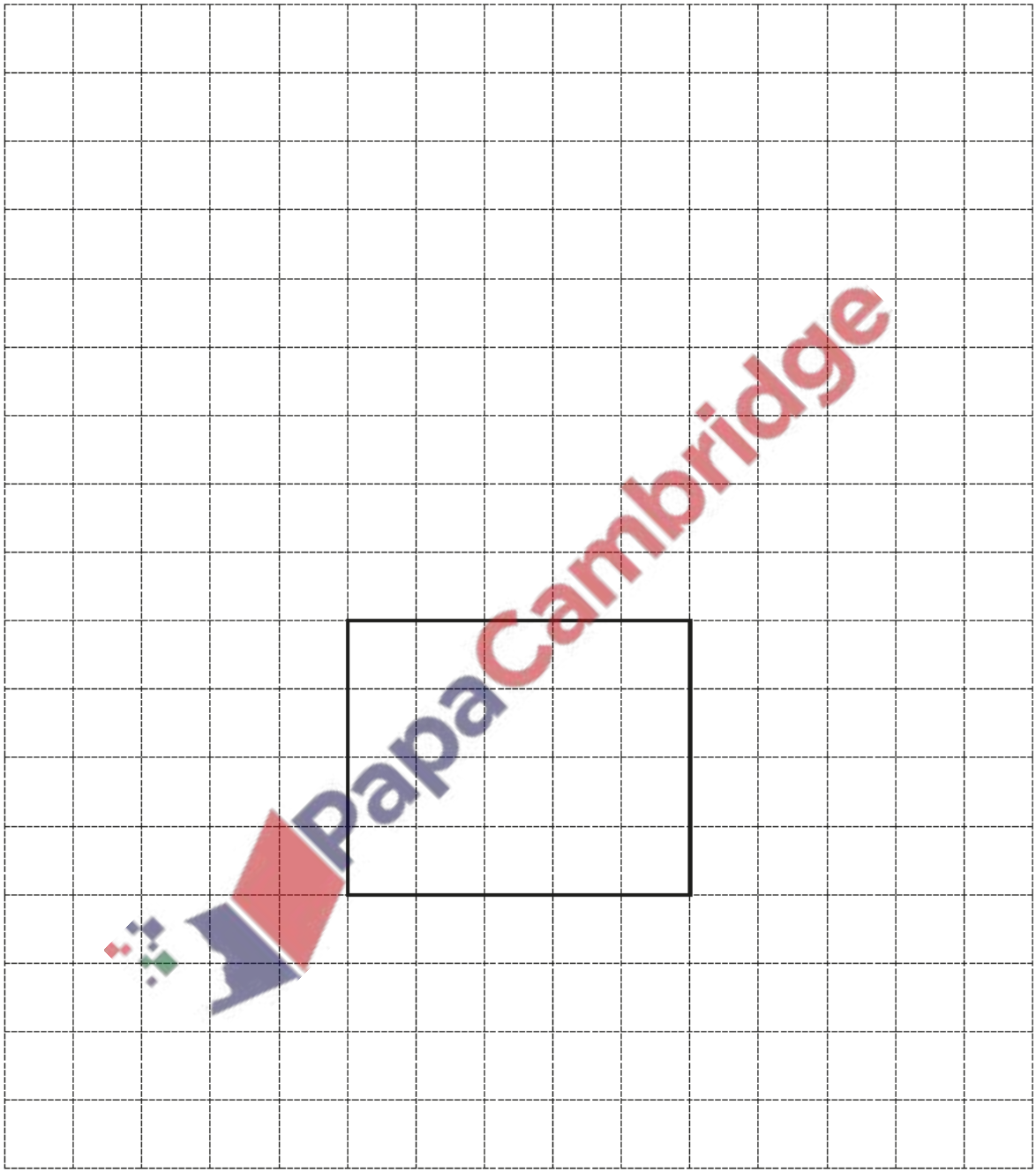
PapaCambridge

UT = ... cm [2]

6. Nov/2020/Paper_13/No.12

(a) A cuboid has length 5 cm, width 4 cm and height 3 cm.

On the 1 cm^2 grid, complete the net of the cuboid.
One face has been drawn for you.



PapaCambridge

[3]

(b) Find the volume of the cuboid.

..... cm^3 [2]

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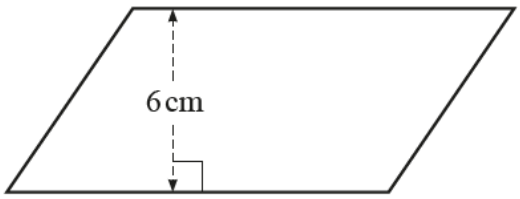
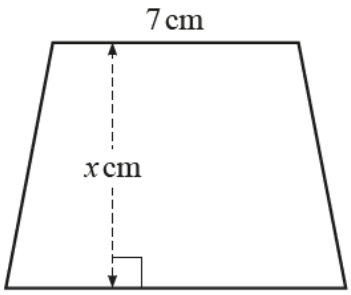
7. Nov/2020/Paper_13/No.13





NOT TO SCALE

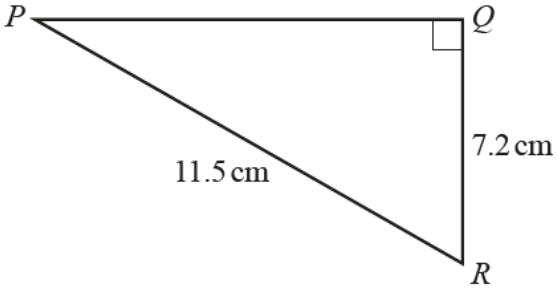
The area of the parallelogram is the same as the area of the trapezium.

Work out the value of x.

PapaCambridge

$x =$ ..... [3]

8. Nov/2020/Paper_13/No.22



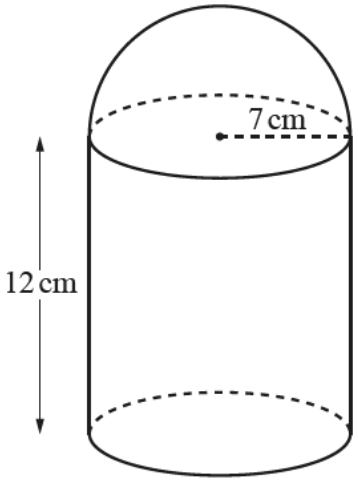
NOT TO SCALE

Calculate PQ.

$PQ =$ ..... cm [3]

PapaCambridge

9. Nov/2020/Paper_21/No.18



NOT TO SCALE

The diagram shows a solid made from a cylinder and a hemisphere, both of radius 7 cm. The cylinder has length 12 cm.

Work out the total surface area of the solid.
[The surface area, A, of a sphere with radius r is $A = 4\pi r^2$.]

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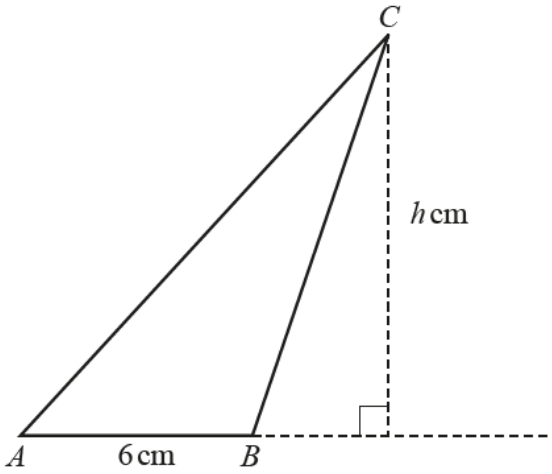
..... cm^2 [4]

10. Nov/2020/Paper_22/No.7



NOT TO SCALE

The area of triangle ABC is $27\,\text{cm}^2$ and $AB = 6\,\text{cm}$.

Calculate the value of h.

$h =$ ..... [2]

PapaCambridge

11. Nov/2020/Paper_22/No.13

The length of one side of a rectangle is 12 cm.
The length of the diagonal of the rectangle is 13 cm.

Calculate the area of the rectangle.

..... cm^2 [3]

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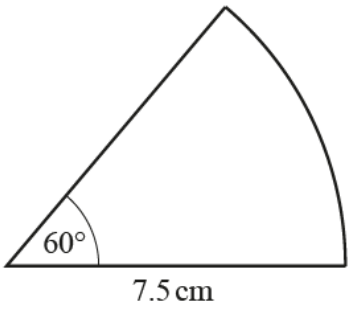
12. Nov/2020/Paper_22/No.15



NOT TO SCALE

Calculate the area of this sector of a circle.

..... cm^2 [2]

PapaCambridge

13. Nov/2020/Paper_22/No.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]

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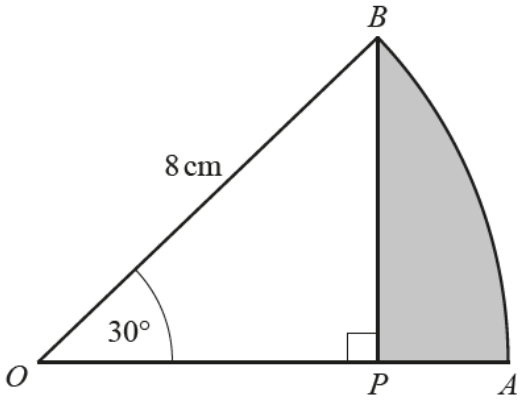
14. Nov/2020/Paper_23/No.21



NOT TO SCALE

OAB is the sector of a circle, centre O.
$OB = 8$ cm and angle $AOB = 30°$.
BP is perpendicular to OA.

(a) Calculate AP.

$AP =$ ..... cm [3]

(b) Work out the area of the shaded region APB.

..... cm^2 [3]

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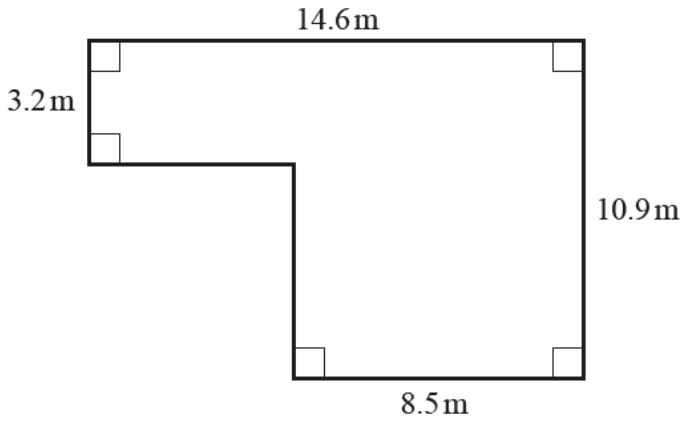
15. Nov/2020/Paper_33/No.4

(a) The diagram shows the plan of part of Rachel's garden.



NOT TO SCALE

Calculate the area.

..... m^2 [3]

(b) Rachel has a pond in her garden in the shape of a circle.
The circumference of the pond is 4.25 m.

Calculate the diameter of the pond.
Give your answer in centimetres.

..... cm [3]

(c) A plant pot is a cylinder with radius 15 cm and height 24 cm.

Calculate the volume of the pot.

..... cm^3 [2]

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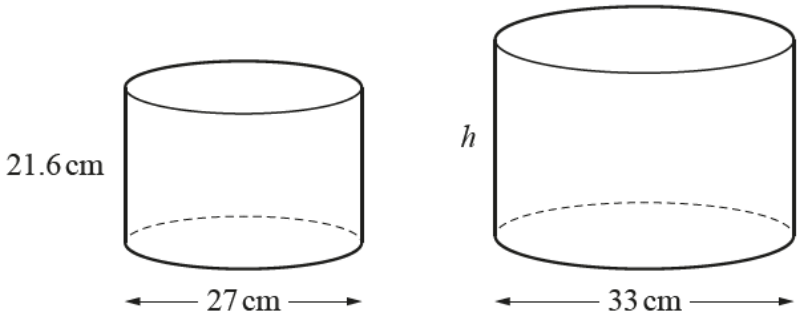
(d) The diagram shows two mathematically similar plant pots.



The smaller pot has height 21.6 cm and diameter 27 cm.
The larger pot has diameter 33 cm.

Find the height, h, of the larger pot.

$h =$ ..... cm [2]

(e) A shop sells bags of compost in three different sizes.

Small	Medium	Large
30 litres $5.82	50 litres $9.45	75 litres $14.50

Work out which size of bag gives the best value.
Show how you decide.

..... [3]

PapaCambridge

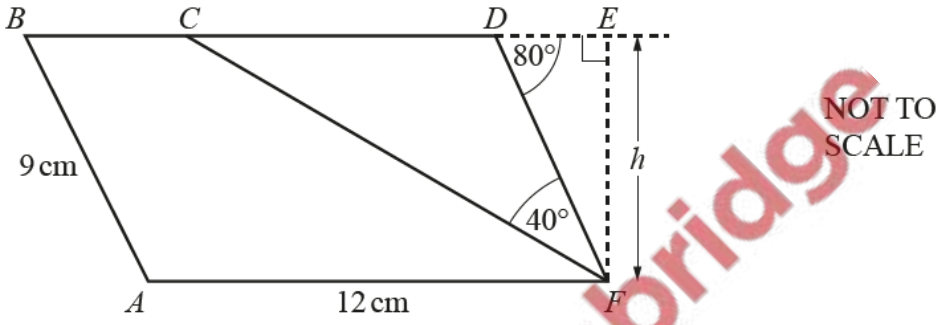
16. Nov/2020/Paper_41/No.4

(a) A rectangle measures 8.5 cm by 10.7 cm, both correct to 1 decimal place.

Calculate the upper bound of the perimeter of the rectangle.

..... cm [3]

(b)



ABDF is a parallelogram and *BCDE* is a straight line.
$AF = 12$ cm, $AB = 9$ cm, angle $CFD = 40°$ and angle $FDE = 80°$.

(i) Calculate the height, h, of the parallelogram.

$h =$ ..... cm [2]

(ii) Explain why triangle *CDF* is isosceles.

.....

..... [2]

(iii) Calculate the area of the **trapezium** *ABCF*.

..... cm^2 [3]

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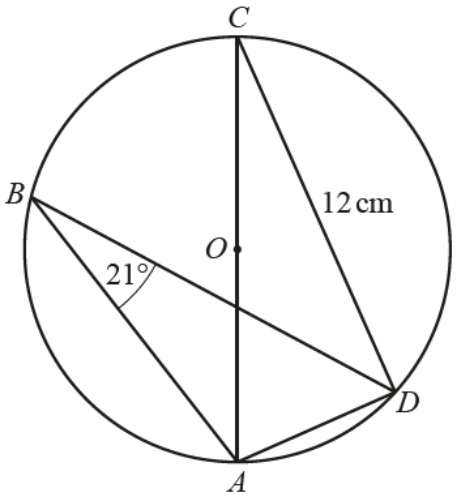
(c)



NOT TO SCALE

A, B, C and D are points on the circle, centre O.
Angle $ABD = 21°$ and $CD = 12$ cm.

Calculate the area of the circle.

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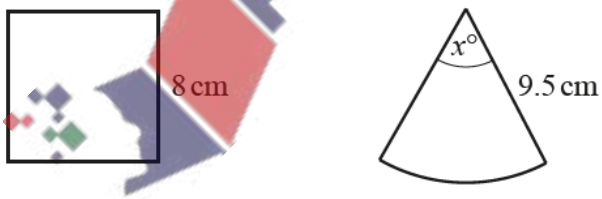
..... cm^2 [5]

(d)



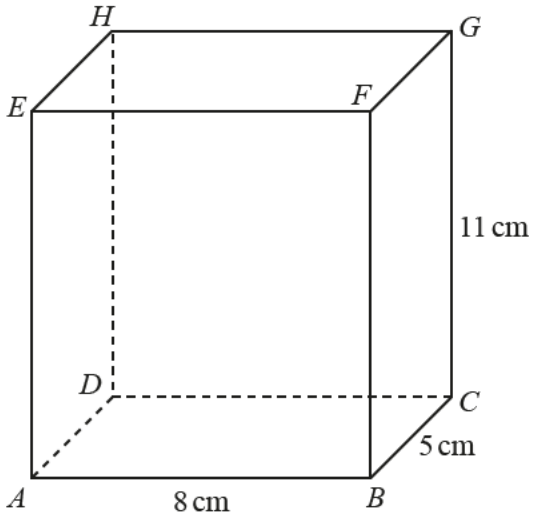
NOT TO SCALE

The diagram shows a square with side length 8 cm and a sector of a circle with radius 9.5 cm and sector angle $x°$.
The perimeter of the square is equal to the perimeter of the sector.

Calculate the value of x.

$x =$ ..... [3]

17. Nov/2020/Paper_43/No.6



NOT TO SCALE

ABCDEFGH is a cuboid.
$AB = 8$ cm, $BC = 5$ cm and $CG = 11$ cm.

(a) Work out the volume of the cuboid.

..... cm^3 [2]

(b) Ivana has a pencil of length 13 cm.

Does this pencil fit completely inside the cuboid?
Show how you decide.

[4]

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(c) **(i)** Calculate angle CAB.

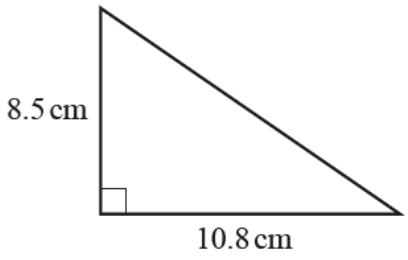
Angle CAB = ... [2]

(ii) Calculate angle GAC.

Angle GAC = ... [2]

PapaCambridge

18. March/2020/Paper_12/No.14



NOT TO SCALE

The diagram shows a right-angled triangle.

(a) Calculate the area.

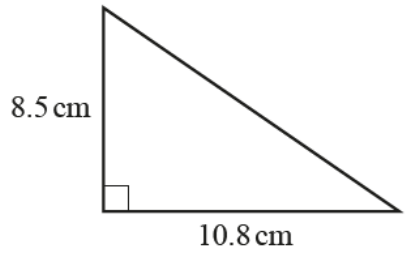
..... cm^2 [2]

(b) Calculate the perimeter.

..... cm [3]

PapaCambridge

19. March/2020/Paper_22/No.7



NOT TO SCALE

The diagram shows a right-angled triangle.

(a) Calculate the area.

..... cm^2 [2]

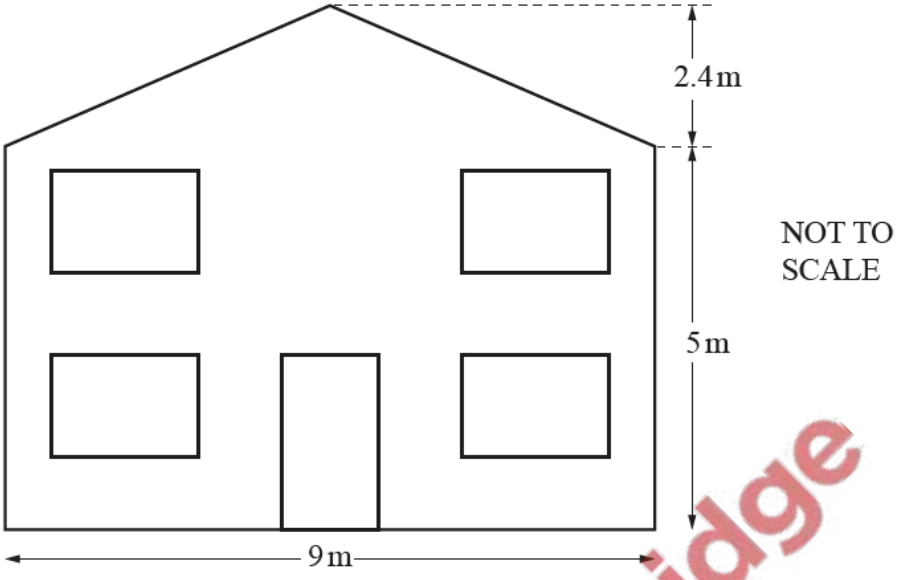
(b) Calculate the perimeter.

..... cm [3]

PapaCambridge

20. March/2020/Paper_32/No.4

(a)



The diagram shows the front of Pranav's house.

(i) Work out the total area of the front of his house.

..... m^2 [3]

(ii) The door is 0.9 m wide and 2.1 m high.
Each of the four windows are 1.5 m wide and 1.2 m high.

Work out the total area of the door and the four windows.

..... m^2 [3]

(iii) Pranav paints the front of his house but not the door and not the four windows.

Work out the area he paints.

..... m^2 [1]

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(b) Pranav paints a wall of area $53\,m^2$.
One litre of paint covers an area of $4.5\,m^2$.
Paint is sold in 2.5 litre tins, each costing \$24.75 .
Pranav buys the least number of tins to paint this wall.

Work out the cost of the paint.

\$ ..... [4]

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21. March/2020/Paper_42/No.4

A solid metal cone has radius 1.65 cm and slant height 4.70 cm.

(a) Calculate the **total** surface area of the cone.
[The curved surface area, A, of a cone with radius r and slant height l is $A = \pi rl$.]

..... cm^2 [2]

(b) Find the angle the slant height makes with the base of the cone.

..... [2]

(c) **(i)** Calculate the volume of the cone.
[The volume, V, of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

..... cm^3 [4]

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(ii) A metal sphere with radius 5 cm is melted down to make cones identical to this one.

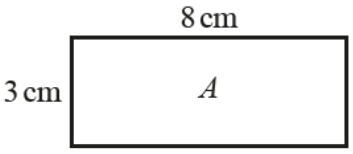
Calculate the number of complete identical cones that are made.
[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

..... [4]

PapaCambridge

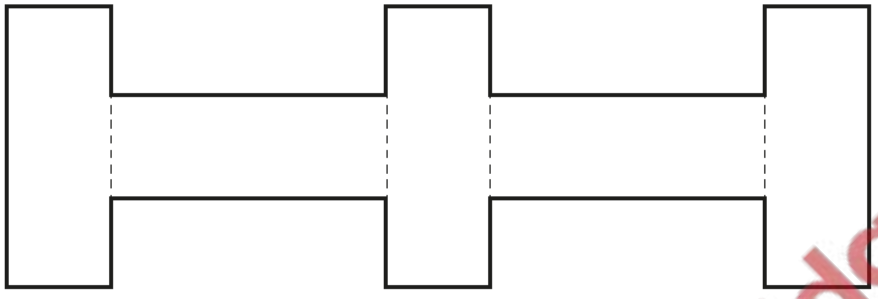
22. June/2020/Paper_11/No.7

Rectangle A measures 3 cm by 8 cm.



NOT TO SCALE

Five rectangles congruent to A are joined to make a shape.



NOT TO SCALE

Work out the perimeter of this shape.

..... cm [2]

PapaCambridge

23. June/2020/Paper_11/No.11

A cone has radius 4.5 cm and height 10.4 cm.

Calculate, in terms of π, the volume of the cone.
[The volume, V, of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

..... cm^3 [2]

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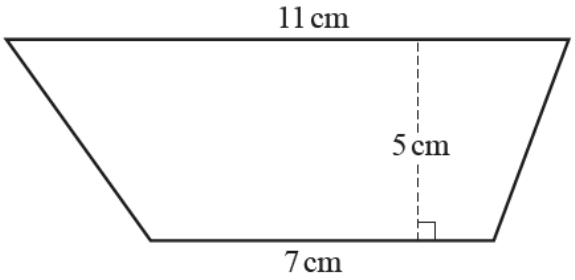
24. June/2020/Paper_12/No.15



NOT TO SCALE

Calculate the area of the trapezium.

..... cm^2 [2]

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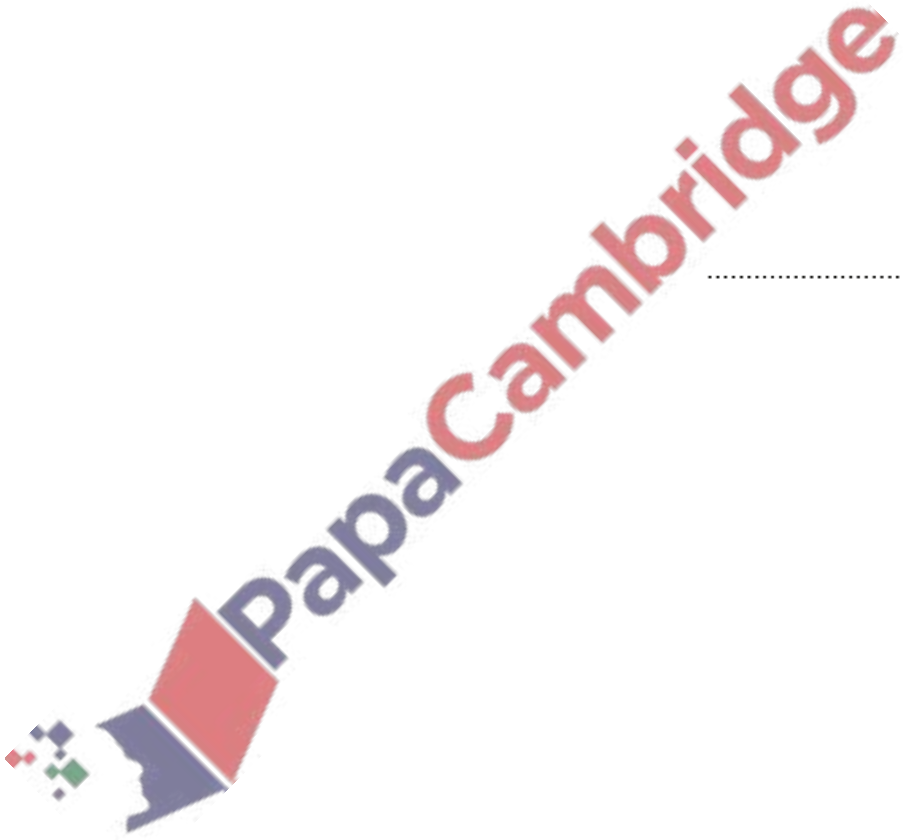
25. June/2020/Paper_13/No.21

A solid cylinder has radius 3 cm and height 4.5 cm.

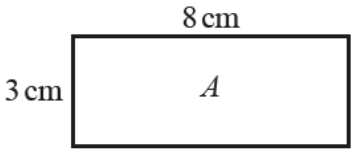
Calculate the **total** surface area of the cylinder.



..... cm^2 [4]

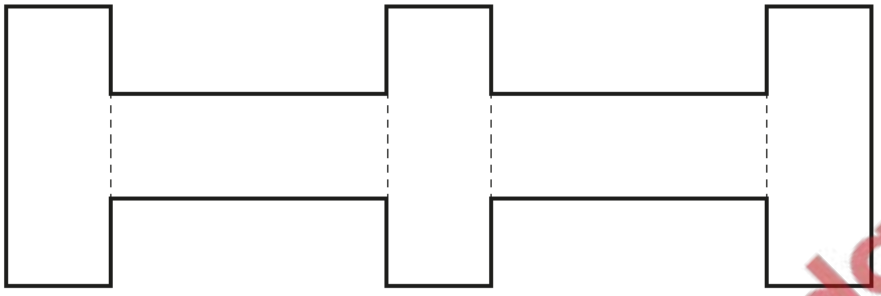
26. June/2020/Paper_21/No.1

Rectangle A measures 3 cm by 8 cm.



NOT TO SCALE

Five rectangles congruent to A are joined to make a shape.



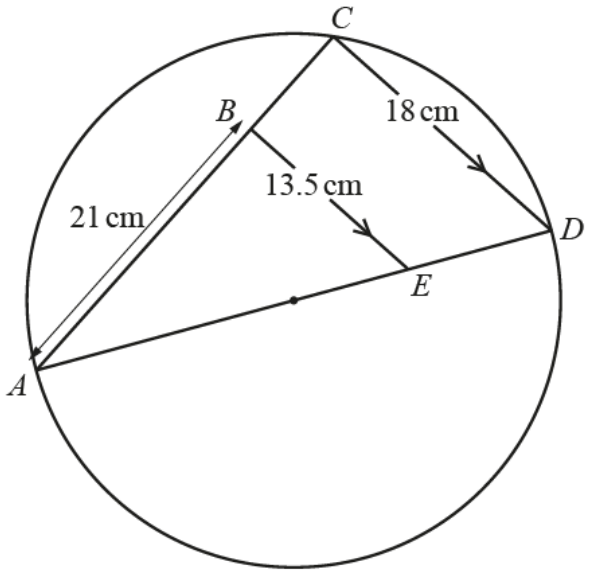
NOT TO SCALE

Work out the perimeter of this shape.

..... cm [2]

PapaCambridge

27. June/2020/Paper_21/No.13



NOT TO SCALE

C lies on a circle with diameter AD.
B lies on AC and E lies on AD such that BE is parallel to CD.
$AB = 21$ cm, $CD = 18$ cm and $BE = 13.5$ cm.

Work out the radius of the circle.

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..... cm [5]

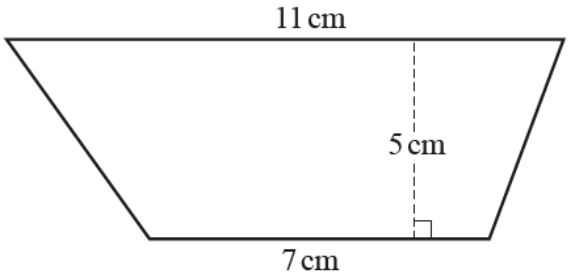
28. June/2020/Paper_21/No.22

Find the area of a regular hexagon with side length 7.4 cm.

..... cm^2 [3]

PapaCambridge

29. June/2020/Paper_22/No.6



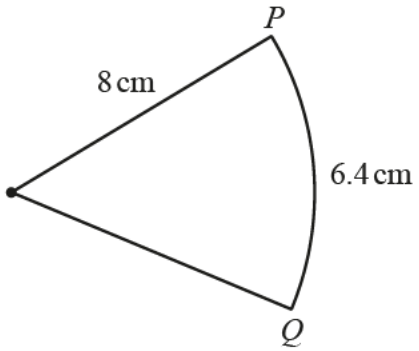
NOT TO SCALE

Calculate the area of the trapezium.

..... cm^2 [2]

PapaCambridge

30. June/2020/Paper_22/No.24



NOT TO SCALE

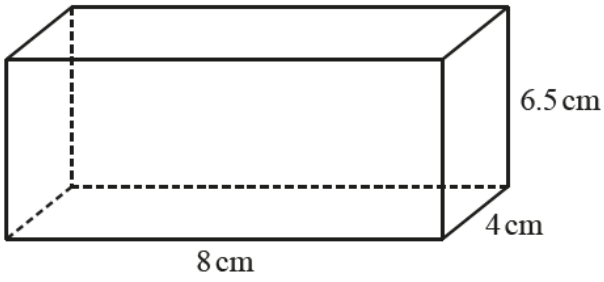
The diagram shows a sector of a circle of radius 8 cm.
The length of the arc PQ is 6.4 cm.

Find the area of the sector.

PapaCambridge

..... cm^2 [4]

31. June/2020/Paper_23/No.2



NOT TO SCALE

The diagram shows a cuboid.

Calculate the volume of the cuboid.

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..... cm^3 [1]

32. June/2020/Paper_23/No.9

Calculate the area of the sector of a circle with radius 65 mm and sector angle 42°.
Give your answer in square centimetres.

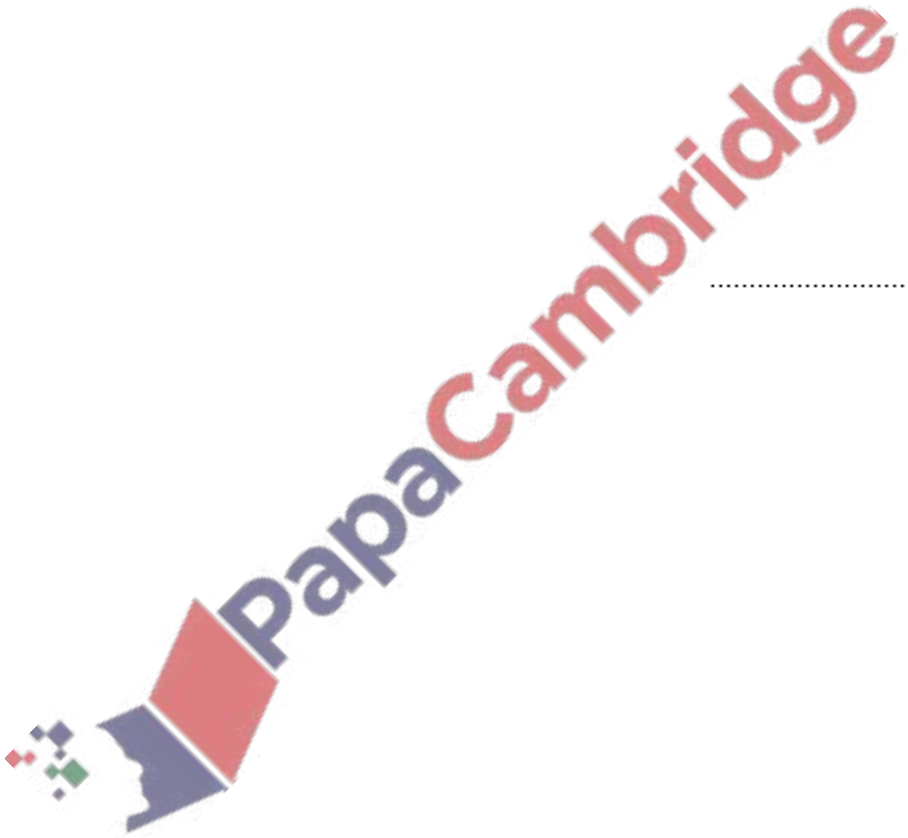
..... cm^2 [3]

PapaCambridge

33. June/2020/Paper_23/No.10

A solid cylinder has radius 3 cm and height 4.5 cm.

Calculate the **total** surface area of the cylinder.



..... cm^2 [4]

34. June/2020/Paper_23/No.12

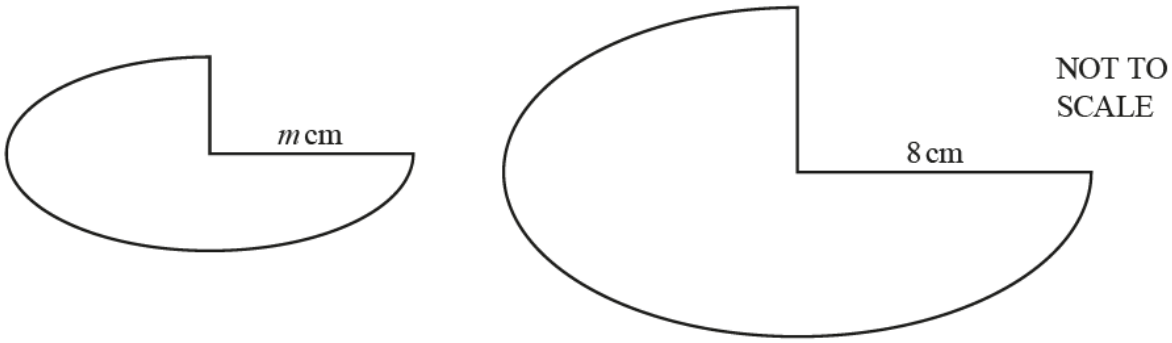
The total perimeter of a semicircle is 19.02 cm.

Calculate the radius of the semicircle.

..... cm [3]

PapaCambridge

35. June/2020/Paper_23/No.17



The diagram shows two shapes that are mathematically similar.
The smaller shape has area 52.5 cm^2 and the larger shape has area 134.4 cm^2.

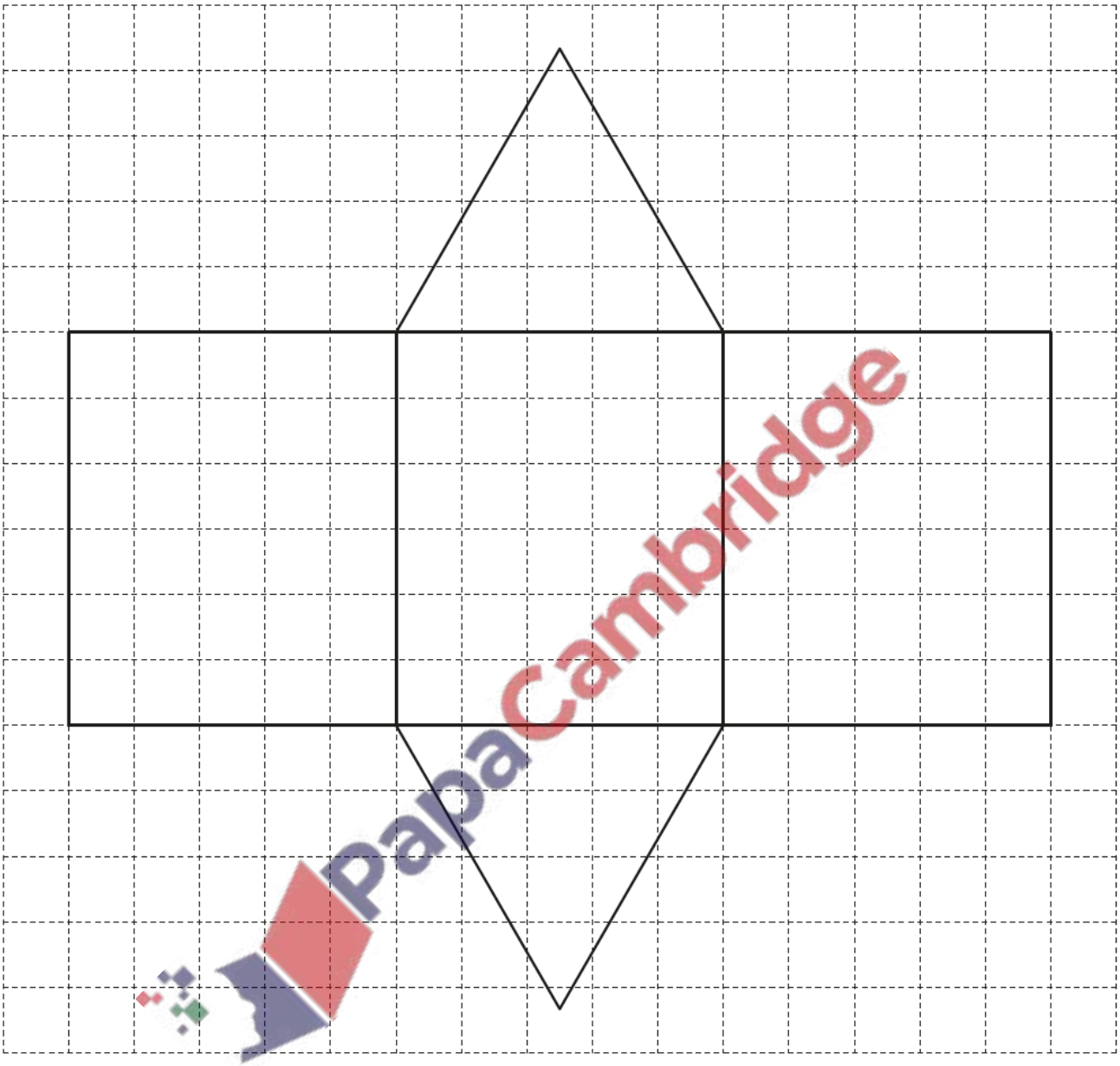
Calculate the value of m.

PapaCambridge

m = ... [3]

36. June/2020/Paper_31/No.3

The diagram shows the net of a triangular prism on a 1 cm^2 grid.



PapaCambridge

(a) Write down the mathematical name for the type of triangle shown on the grid.

..... [1]

(b) (i) Measure the perpendicular height of the triangle.

..... cm [1]

(ii) Calculate the area of the triangle.

..... cm^2 [2]

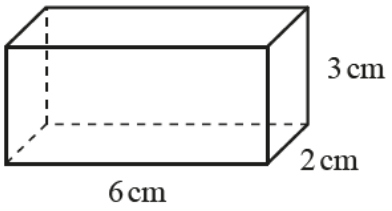
(iii) Calculate the volume of the triangular prism.

..... cm^3 [2]

PapaCambridge

37. June/2020/Paper_32/No.6

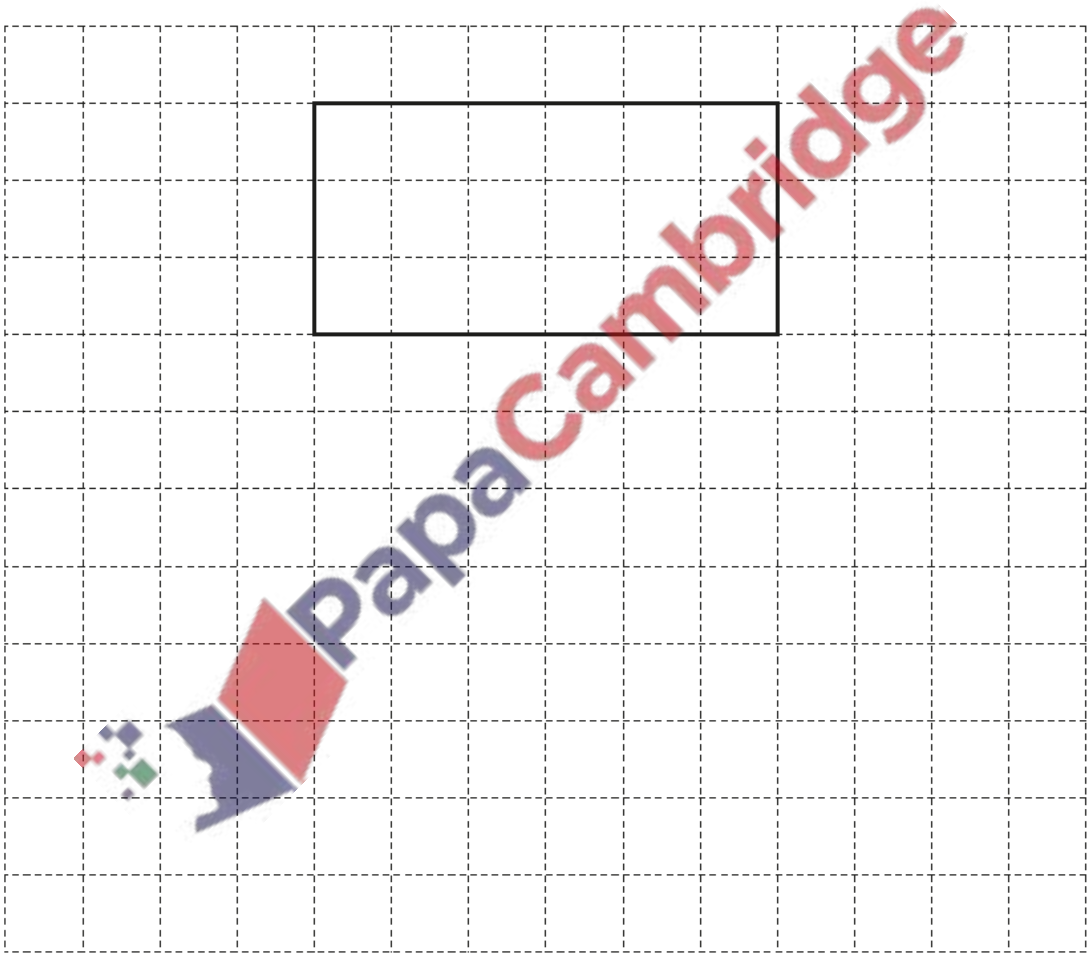
(a)



NOT TO SCALE

The diagram shows a cuboid.

On the 1 cm^2 grid, complete the net of the cuboid.
One face has been drawn for you.



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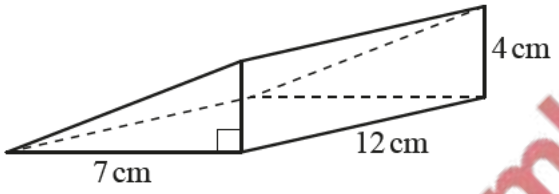
[3]

(b) A cube has a surface area of $384\,cm^2$.

Find the length of one of its sides.

..... cm [3]

(c)



NOT TO SCALE

The diagram shows a right-angled triangular prism.

Work out the volume of the prism.

..... cm^3 [3]

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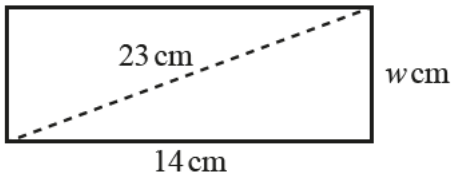
38. June/2020/Paper_32/No.7c,7d

(c)



NOT TO SCALE

The diagram shows a rectangle 14 cm by w cm.
The diagonal is 23 cm.

Calculate the value of w.

$w =$ ..... [3]

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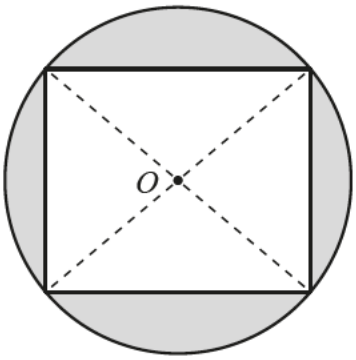
(d)



NOT TO SCALE

The diagram shows a square with vertices on the circumference of a circle, centre O.
The radius of the circle is 6 cm.

Work out the shaded area.

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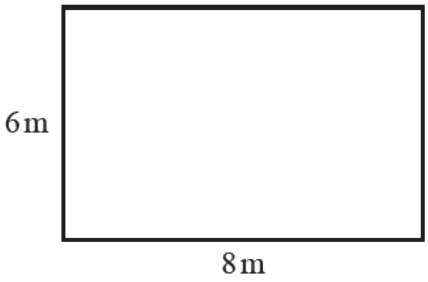
..... cm^2 [5]

39. June/2020/Paper_33/No.3

(a)



NOT TO SCALE

The diagram shows a rectangular patio with sides 6 m and 8 m.

(i) Work out the perimeter of the patio.

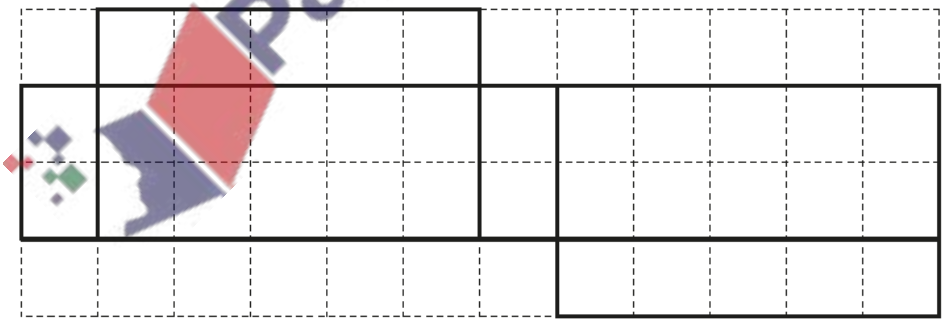
..... m [1]

(ii) Henri covers the patio floor with square tiles.
The tiles are 0.5 m by 0.5 m.

Work out the number of tiles he needs.

..... [2]

(b) The diagram shows the net of a solid on a 1 cm^2 grid.



(i) Write down the mathematical name for the solid.

..... [1]

(ii) Work out the volume of the solid.

..... cm^3 [2]

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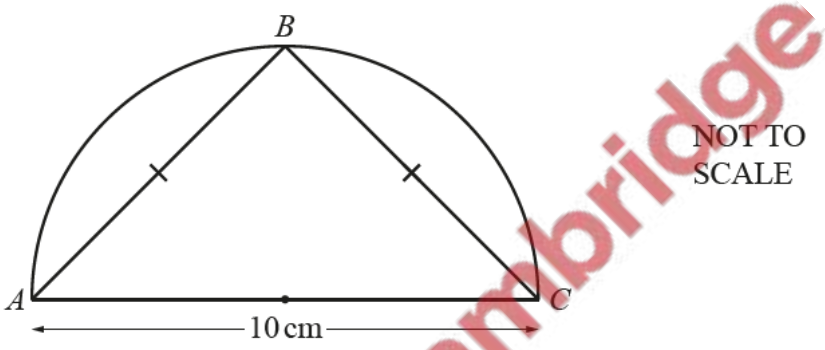
(c) A square has perimeter $12x$.

Find an expression, in terms of x, for the area of the square.
Give your answer in its simplest form.

..... [3]

(d)



The diagram shows a semicircle with diameter AC.
B is a point on the circumference and $AB = BC$.

Work out the area of triangle ABC.

..... cm^2 [3]

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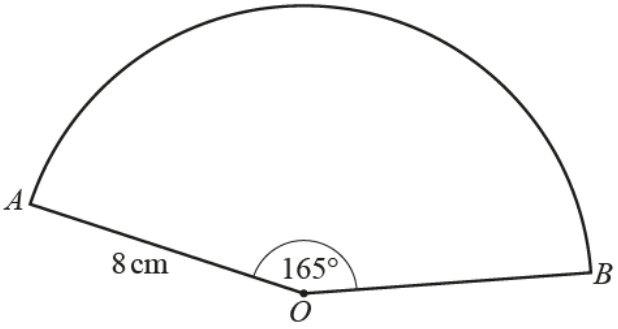
40. June/2020/Paper_41/No.9



NOT TO SCALE

The diagram shows a sector of a circle with centre O, radius 8 cm and sector angle 165°.

(a) Calculate the total perimeter of the sector.

..... cm [3]

(b) The surface area of a sphere is the same as the area of the sector.

Calculate the radius of the sphere.
[The surface area, A, of a sphere with radius r is $A = 4\pi r^2$.]

..... cm [4]

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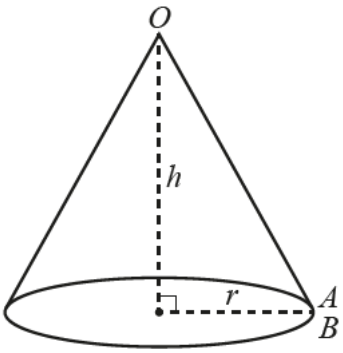
(c)



NOT TO SCALE

A cone is made from the sector by joining OA to OB.

(i) Calculate the radius, r, of the cone.

$r =$ ..... cm [2]

(ii) Calculate the volume of the cone.
[The volume, V, of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

..... cm^3 [4]

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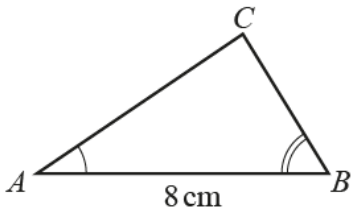
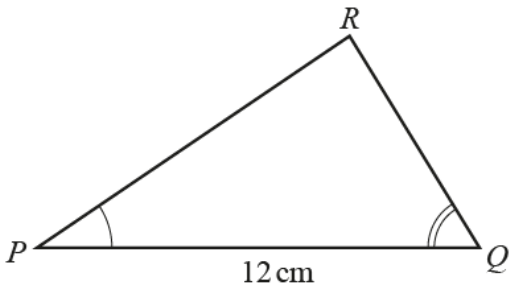
41. June/2020/Paper_42/No.8

(a)





NOT TO SCALE

Triangle ABC is mathematically similar to triangle PQR.
The area of triangle ABC is $16\,cm^2$.

(i) Calculate the area of triangle PQR.

..... cm^2 [2]

(ii) The triangles are the cross-sections of prisms which are also mathematically similar.
The volume of the smaller prism is $320\,cm^3$.

Calculate the length of the larger prism.

..... cm [3]

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(b) A cylinder with radius 6 cm and height h cm has the same volume as a sphere with radius 4.5 cm.

Find the value of h.

[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

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

(c) A solid metal cube of side 20 cm is melted down and made into 40 solid spheres, each of radius r cm.

Find the value of r.

[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

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$r =$ ..... [3]

(d) A solid cylinder has radius x cm and height $\frac{7x}{2}$ cm.

The surface area of a sphere with radius R cm is equal to the total surface area of the cylinder.

Find an expression for R in terms of x.

[The surface area, A, of a sphere with radius r is $A = 4\pi r^2$.]

$R =$ ..... [3]

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