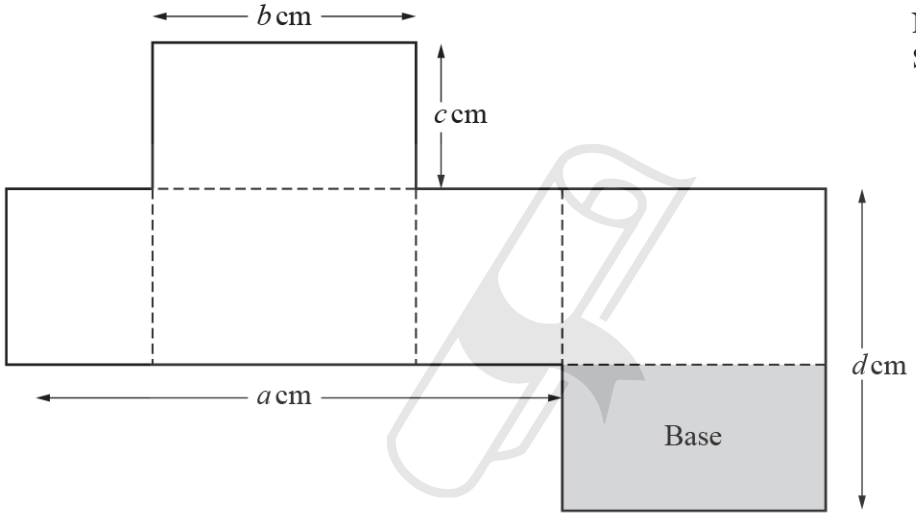
Chapter 5

Mensuration

01. 0580_m24_qp_22 Q: 4

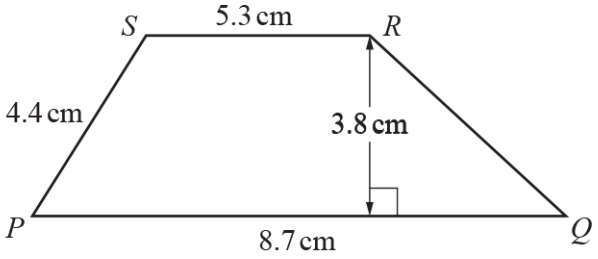


The diagram shows the net of a cuboid with its base shaded.
The length of the cuboid is 10 cm, its width is 4 cm and its height is 5 cm.

Write down the values of each of a, b, c and d.

a = ..., b = ..., c = ..., d = ... [4]

02. 0580_m24_qp_22 Q: 10



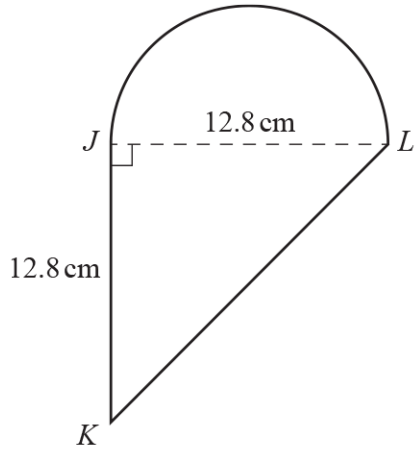
NOT TO SCALE

The diagram shows a trapezium $PQRS$.

Calculate the area of the trapezium.

..... cm^2 [2]

03. 0580_s24_qp_21 Q: 7



NOT TO SCALE

The diagram shows a shape made from a triangle JKL and a semicircle with diameter JL.
JKL is an isosceles right-angled triangle with $JK = JL = 12.8$ cm.

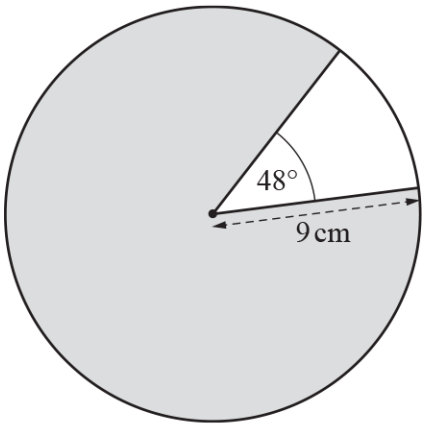
(a) Calculate the area of this shape.

..... cm^2 [3]

(b) Calculate the perimeter of this shape.

..... cm [4]

04. 0580_s24_qp_21 Q: 14



NOT TO SCALE

The diagram shows a circle with radius 9 cm.

Calculate the area of the shaded major sector.

..... cm^2 [3]

---

05. 0580_s24_qp_23 Q: 4

The base of a cuboid measures 10 cm by 7 cm.
The volume of the cuboid is 280 cm^3.

Calculate the height of the cuboid.

..... cm [2]

---

06. 0580_m23_qp_22 Q: 18

Two solids are mathematically similar and have volumes $81\,\text{cm}^3$ and $24\,\text{cm}^3$.
The surface area of the smaller solid is $44\,\text{cm}^2$.

Calculate the surface area of the larger solid.

..... cm^2 [3]

---

07. 0580_s23_qp_21 Q: 6

Calculate the volume of a sphere with diameter 4.8 cm.

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

..... cm^3 [2]

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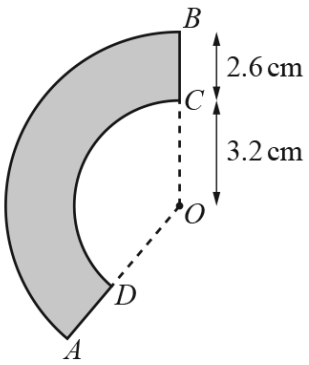
08. 0580_s23_qp_22 Q: 11



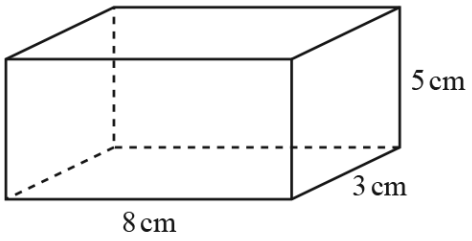
NOT TO SCALE

The diagram shows a shape, $ABCD$, formed by the sectors of two circles with the same centre O.
Both sector angles are 140°, $OC = 3.2\,\text{cm}$ and $CB = 2.6\,\text{cm}$.
The area of the shape is $k\pi\,\text{cm}^2$.

Find the value of k.

$k =$ ..... [3]

09. 0580_s23_qp_23 Q: 3



NOT TO SCALE

Find the total surface area of the cuboid.

..... cm^2 [3]

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10. 0580_s23_qp_23 Q: 16

The volume of a cylinder is 1970 cm^3.
The height of the cylinder is 12.8 cm.

Calculate the radius of the cylinder.

..... cm [3]

---

11. 0580_w23_qp_22 Q: 18

A solid cylinder has radius 5 cm and height 8 cm.

Calculate the total surface area of the cylinder.

..... cm^2 [4]

---

12. 0580_w23_qp_22 Q: 20

The area of a rectangle is 55.2 cm^2, correct to 1 decimal place.
The length of the rectangle is 9 cm, correct to the nearest cm.

Calculate the upper bound of the width of the rectangle.

..... cm [3]

---

13. 0580_w23_qp_23 Q: 11

A bronze sphere has radius 3.6 cm.
The density of bronze is 8.05 g/cm^3.

Find the mass of the sphere.
Give your answer **in kilograms**, correct to the nearest gram.

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

[Density = mass ÷ volume.]

..... kg [4]

---

14. 0580_w23_qp_23 Q: 16

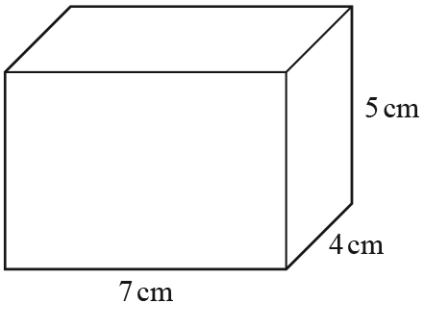
A cylinder with height 12.5 cm has a curved surface area of 105π cm^2.

Calculate the volume of the cylinder.

..... cm^3 [4]

---

15. 0580_m22_qp_22 Q: 4



NOT TO SCALE

Calculate the **total** surface area of this cuboid.

..... cm^2 [3]

---

16. 0580_m22_qp_22 Q: 14

Calculate the circumference of a circle with radius 4.7 cm.

..... cm [2]

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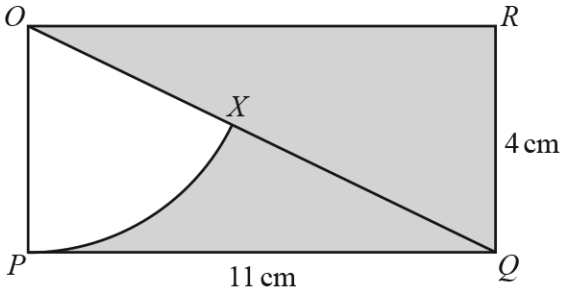
17. 0580_m22_qp_22 Q: 17



NOT TO SCALE

The diagram shows a rectangle $OPQR$ with length 11 cm and width 4 cm.
OQ is a diagonal and OPX is a sector of a circle, centre O.

Calculate the percentage of the rectangle that is shaded.

..... % [5]

---

18. 0580_s22_qp_21 Q: 17

Find the radius of a hemisphere of volume 80 cm^3.

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

..... cm [3]

---

19. 0580_s22_qp_22 Q: 5

Find the total surface area of a cuboid with length 8 cm, width 6 cm and height 3 cm.

..... cm^2 [3]

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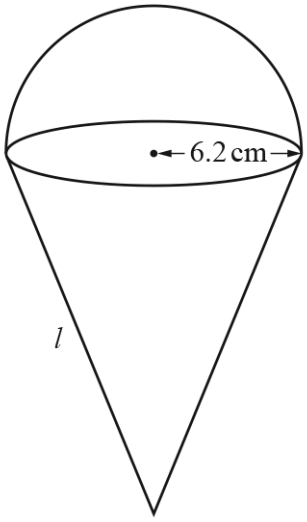
20. 0580_s22_qp_22 Q: 23



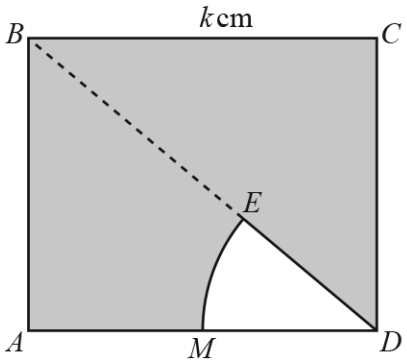
NOT TO SCALE

The diagram shows a solid metal shape made from a cone and a hemisphere, both with radius 6.2 cm. The total surface area of the solid shape is 600 cm^2.

Calculate the slant height, l, of the cone.
[The surface area, A, of a sphere with radius r is $A = 4\pi r^2$.]
[The curved surface area, A, of a cone with radius r and slant height l is $A = \pi rl$.]

l = ... cm [4]

21. 0580_s22_qp_23 Q: 20



NOT TO SCALE

The diagram shows a square $ABCD$ with side length k cm.
MDE is a sector of a circle, centre D.
E lies on the diagonal, BD, of the square.
M is the midpoint of AD.

Find the percentage of the square that is shaded.

..... % [4]

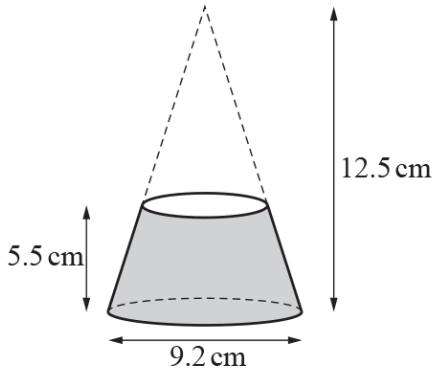
22. 0580_w22_qp_21 Q: 15

The perimeter of a sector of a circle with radius 8 cm is 26 cm.

Calculate the angle of this sector.

..... [3]

23. 0580_w22_qp_22 Q: 21



NOT TO SCALE

A solid is made by cutting a small cone from a larger cone, as shown in the diagram.
The height of the larger cone is 12.5 cm.
The height of the solid is 5.5 cm.
The diameter of the base of the larger cone is 9.2 cm.

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

..... cm^3 [4]

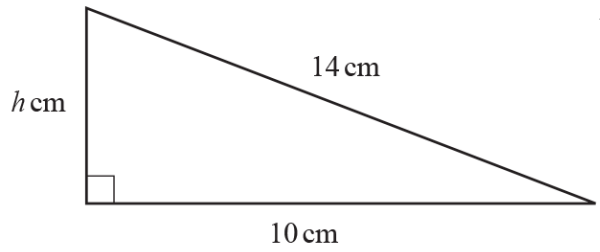
24. 0580_w22_qp_22 Q: 22

The volumes of two mathematically similar objects are $56\,cm^3$ and $875\,cm^3$.
The height of the smaller object is 18 cm.

Find the height of the larger object.

..... cm [3]

25. 0580_w22_qp_23 Q: 10



NOT TO SCALE

The diagram shows a right-angled triangle.

(a) Calculate the value of h.

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

(b) Find the perimeter of this triangle.

..... cm [1]

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26. 0580_w22_qp_23 Q: 18

Two bottles are mathematically similar.
The small bottle has a capacity of 324 ml and a height of 12 cm.
The large bottle has a capacity of 768 ml.

Calculate the height of the large bottle.

..... cm [3]

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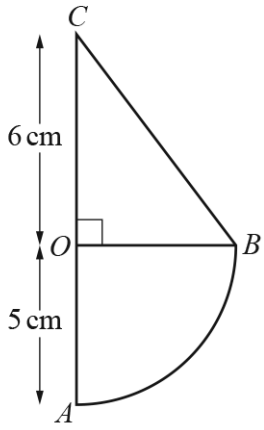
27. 0580_m21_qp_22 Q: 12



NOT TO SCALE

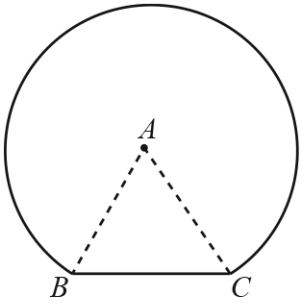
The diagram shows a shape made from a quarter-circle, OAB, and a right-angled triangle OBC.
The radius of the circle is 5 cm and $OC = 6$ cm.

Calculate the area of the shape.

..... cm^2 [3]

28. 0580_s21_qp_22 Q: 19

(a)



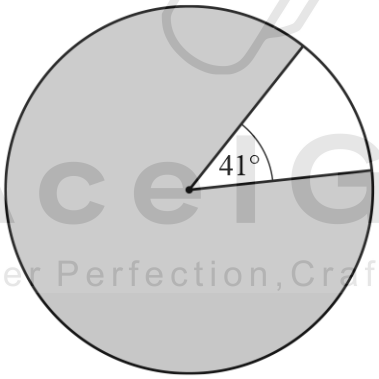
NOT TO SCALE

The diagram shows a shape made from an equilateral triangle ABC and a sector of a circle.
Points B and C lie on the circle, centre A.
The side length of the equilateral triangle is 12.4 cm.

Work out the perimeter of the shape.

..... cm [3]

(b)



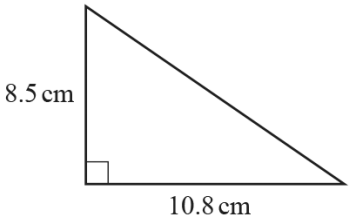
NOT TO SCALE

The diagram shows two sectors of a circle.
The major sector is shaded.
The area of the major sector is 74.5 cm^2.

Calculate the radius of the circle.

..... cm [3]

29. 0580_m20_QP_22 Q: 7



NOT TO SCALE

The diagram shows a right-angled triangle.

(a) Calculate the area.

..... cm^2 [2]

(b) Calculate the perimeter.

..... cm [3]

30. 0580_P20_QP_20 Q: 4

Chai says that $8\,cm^2$ is the same as $80\,mm^2$.

Explain why Chai is wrong.

..... [1]

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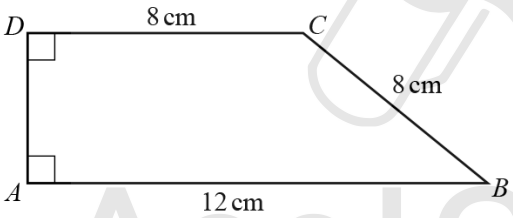
31. 0580_P20_QP_20 Q: 17

Calculate the area of this trapezium.



NOT TO SCALE

..... cm^2 [4]

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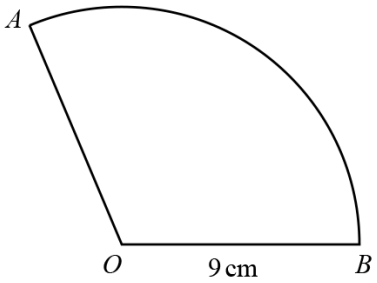
32. 0580_P20_QP_20 Q: 23

AB is an arc of a circle, centre O, radius 9 cm.

The length of the arc AB is 6π cm.
The area of sector AOB is $k\pi$ cm^2.

Find the value of k.



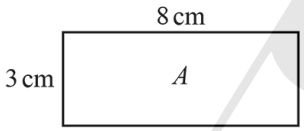
NOT TO SCALE

$k =$ ..... [3]

---

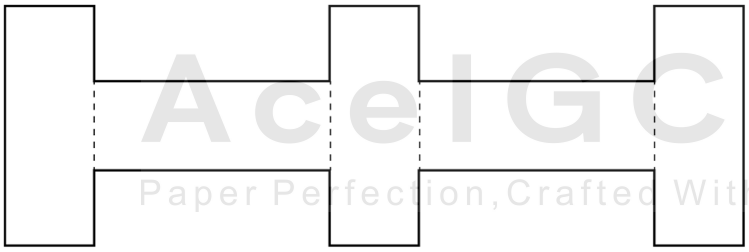
33. 0580_s20_QP_21 Q: 1

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]

---

34. 0580_s20_QP_21 Q: 22

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

..... cm^2 [3]

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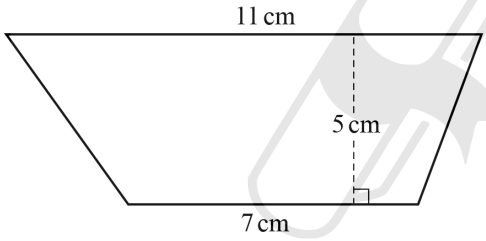
35. 0580_s20_QP_22 Q: 6



NOT TO SCALE

Calculate the area of the trapezium.

..... cm^2 [2]

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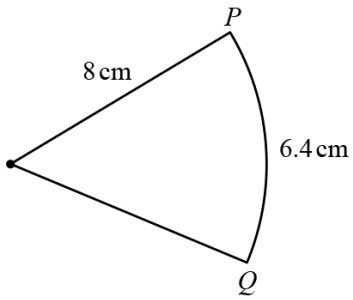
36. 0580_s20_QP_22 Q: 24



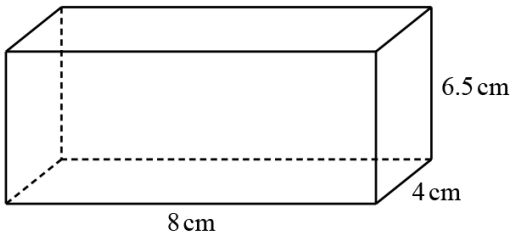
NOT TO SCALE

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.

..... cm^2 [4]

37. 0580_s20_QP_23 Q: 2



NOT TO SCALE

The diagram shows a cuboid.

Calculate the volume of the cuboid.

..... cm^3 [1]

---

38. 0580_s20_QP_23 Q: 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]

---

39. 0580_s20_QP_23 Q: 10

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

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

..... cm^2 [4]

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40. 0580_s20_QP_23 Q: 12

The total perimeter of a semicircle is 19.02 cm.

Calculate the radius of the semicircle.

..... cm [3]

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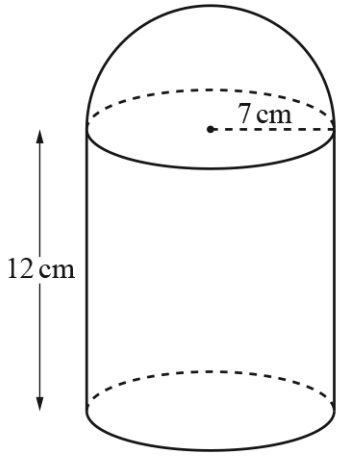
41. 0580_w20_qp_21 Q: 18



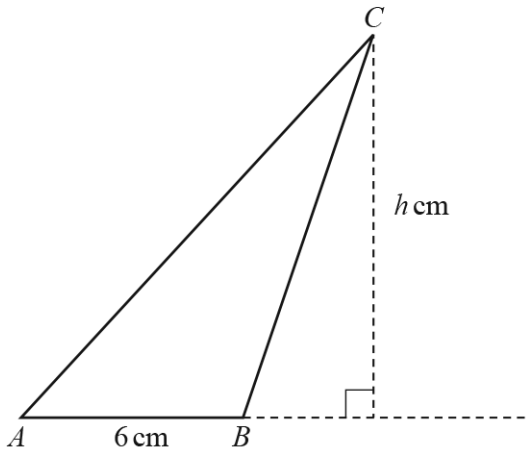
NOT TO SCALE

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 $A = 4\pi r^2$.]

..... cm^2 [4]

42. 0580_w20_qp_22 Q: 7



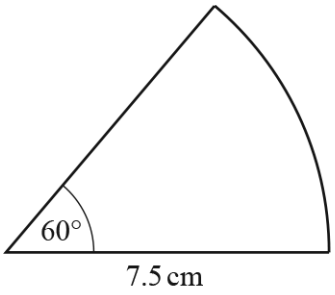
NOT TO SCALE

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

Calculate the value of h.

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

43. 0580_w20_qp_22 Q: 15



NOT TO SCALE

Calculate the area of this sector of a circle.

..... cm^2 [2]

---

44. 0580_w20_qp_23 Q: 7

Change 457 000 cm^2 into m^2.

.....m^2 [1]

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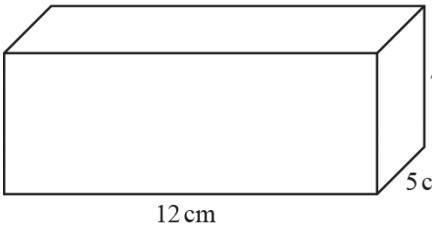
45. 0580_m19_QP_22 Q: 10



NOT TO SCALE

Calculate the total surface area of the cuboid.

.....cm^2 [3]

---

46. 0580_m19_QP_22 Q: 12

A cone with height 14.8 cm has volume 275 cm^3.

Calculate the radius 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]

---

47. 0580_m19_QP_22 Q: 18

A pipe is full of water.
The cross-section of the pipe is a circle, radius 2.6 cm.
Water flows through the pipe into a tank at a speed of 12 centimetres per second.

Calculate the number of litres that flow into the tank in one hour.

..... litres [3]

---

48. 0580_s19_QP_21 Q: 4

An equilateral triangle has sides of length 15 cm, correct to the nearest centimetre.

Calculate the upper bound of the perimeter of this triangle.

..... cm [1]

---

49. 0580_s19_QP_21 Q: 5

The volume of a cuboid is 180 cm^3.
The base is a square of side length 6 cm.

Calculate the height of this cuboid.

..... cm [2]

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50. 0580_s19_QP_21 Q: 19

A model of a car has a scale 1 : 20.
The volume of the actual car is $12\,m^3$.

Find the volume of the model.
Give your answer in cubic centimetres.

.....cm^3 [3]

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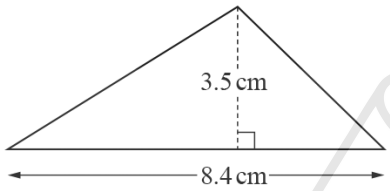
51. 0580_s19_QP_22 Q: 7



NOT TO SCALE

Calculate the area of this triangle.

..... cm^2 [2]

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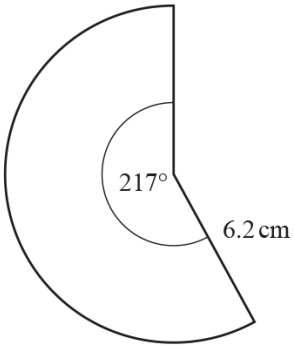
52. 0580_s19_QP_23 Q: 12



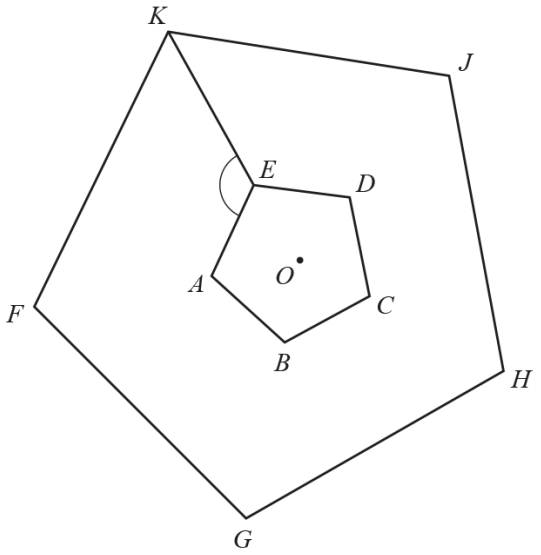
NOT TO
SCALE

The diagram shows a sector of a circle with radius 6.2 cm and sector angle 217°.

Calculate the area of this sector.

..... cm^2 [2]

53. 0580_s19_QP_23 Q: 25



NOT TO SCALE

The diagram shows two regular pentagons.
Pentagon *FGHJK* is an enlargement of pentagon *ABCDE*, centre *O*.

(a) Find angle *AEK*.

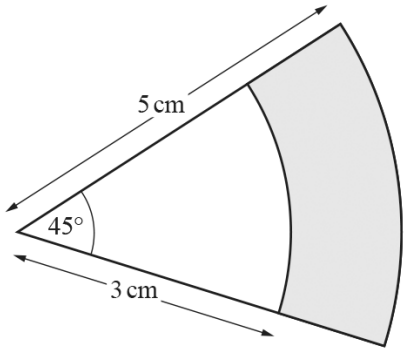
Angle *AEK* = ... [4]

(b) The area of pentagon *FGHJK* is 73.5 cm^2.
The area of pentagon *ABCDE* is 6 cm^2.

Find the ratio perimeter of pentagon *FGHJK* : perimeter of pentagon *ABCDE* in its simplest form.

..... : ..... [2]

54. 0580_w19_QP_21 Q: 17



NOT TO SCALE

The diagram shows two sectors of circles with the same centre.

Calculate the shaded area.

..... cm^2 [3]

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55. 0580_w19_QP_21 Q: 22

A pipe is completely full of water.
Water flows through the pipe at a speed of 1.2 m/s into a tank.
The cross-section of the pipe has an area of 6 cm^2.

Calculate the number of litres of water flowing into the tank in 1 hour.

..... litres [4]

---

56. 0580_w19_QP_22 Q: 13

Two mathematically similar containers have heights of 30 cm and 75 cm.
The larger container has a capacity of 5.5 litres.

Calculate the capacity of the smaller container.
Give your answer in millilitres.

..... ml [3]

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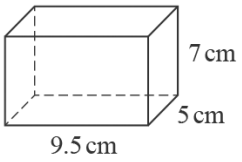
57. 0580_w19_QP_23 Q: 9

A cuboid measures 5 cm by 7 cm by 9.5 cm.



NOT TO SCALE

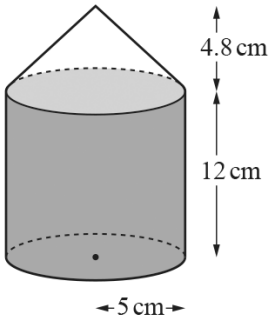
Work out the surface area of this cuboid.

..... cm^2 [3]

---

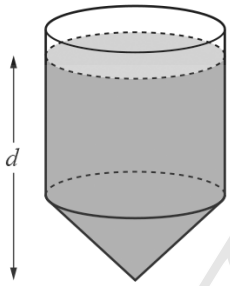
58. 0580_w19_QP_23 Q: 22

A container is made from a cylinder and a cone, each of radius 5 cm.
The height of the cylinder is 12 cm and the height of the cone is 4.8 cm.



NOT TO SCALE

The cylinder is filled completely with water.
The container is turned upside down as shown below.



NOT TO SCALE

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

$d =$ ..... cm [5]

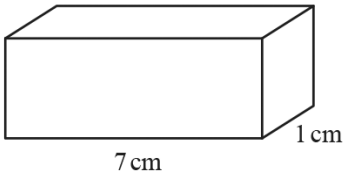
59. 0580_s18_QP_21 Q: 6

Calculate the area of a circle with radius 5.1 cm.

.....cm^2 [2]

---

60. 0580_s18_QP_22 Q: 14



NOT TO SCALE

The diagram shows a solid cuboid with base area 7 cm^2.
The volume of this cuboid is 21 cm^3.

Work out the total surface area.

..... cm^2 [3]

---

61. 0580_s18_QP_22 Q: 15

Find the volume of a cylinder of radius 5 cm and height 8 cm.
Give the units of your answer.

.... [3]

---

62. 0580_w18_QP_21 Q: 10

A water tank in the shape of a cuboid has length 1.5 metres and width 1 metre.
The water in the tank is 60 centimetres deep.

Calculate the number of litres of water in the tank.

..... litres [3]

---

63. 0580_w18_QP_22 Q: 11

An equilateral triangle has side length 12 cm, correct to the nearest centimetre.

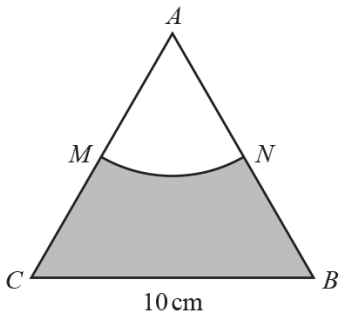
Find the lower bound and the upper bound of the perimeter of the triangle.

Lower bound = ... cm

Upper bound = ... cm [2]

---

64. 0580_w18_QP_22 Q: 21



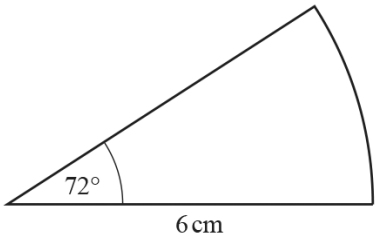
NOT TO SCALE

The diagram shows an equilateral triangle ABC with sides of length 10 cm.
AMN is a sector of a circle, centre A.
M is the mid-point of AC.

Work out the area of the shaded region.

..... cm^2 [4]

65. 0580_w18_QP_23 Q: 19



NOT TO SCALE

The diagram shows a sector of a circle with radius 6 cm and sector angle 72°.
The perimeter of this sector is $(p + q\pi)$ cm.

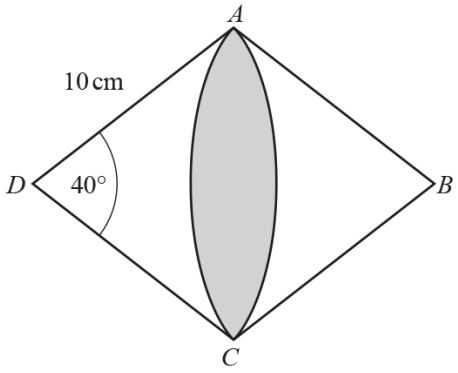
Find the value of p and the value of q.

p = ...

q = ... [3]

66. 0580_s17_QP_21 Q: 19

ABCD is a rhombus with side length 10 cm.



NOT TO SCALE

Angle $ADC = 40°$.
DAC is a sector of a circle with centre *D*.
BAC is a sector of a circle with centre *B*.

Calculate the shaded area.

..... cm^2 [4]

---

67. 0580_s17_QP_22 Q: 3

Change 6200 cm^2 into m^2.

..... m^2 [1]

---

68. 0580_s17_QP_23 Q: 5

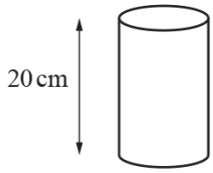
Calculate the volume of a **hemisphere** with radius 3.2 cm.

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

.....cm^3 [2]

69. 0580_w17_QP_21 Q: 20

(a)



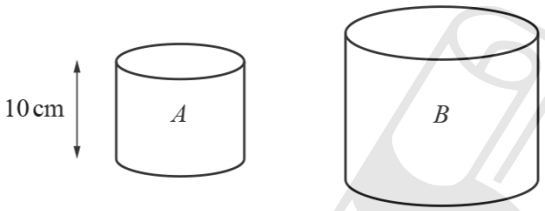
NOT TO SCALE

A cylinder has height 20 cm.
The area of the circular cross section is 74 cm^2.

Work out the volume of this cylinder.

..... cm^3 [1]

(b) Cylinder *A* is mathematically similar to cylinder *B*.



NOT TO SCALE

The height of cylinder *A* is 10 cm and its surface area is 440 cm^2.
The surface area of cylinder *B* is 3960 cm^2.

Calculate the height of cylinder *B*.

..... cm [3]

70. 0580_w17_QP_22 Q: 7

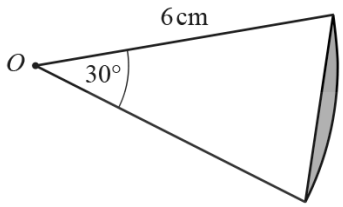
The area of a triangle is 528 cm^2.
The length of its base is 33 cm.

Calculate the perpendicular height of the triangle.

..... cm [2]

---

71. 0580_w17_QP_22 Q: 23



NOT TO SCALE

The diagram shows a sector of a circle, centre O and radius 6 cm.
The sector angle is 30°.
The area of the shaded segment is $(k\pi - c)$ cm^2, where k and c are integers.

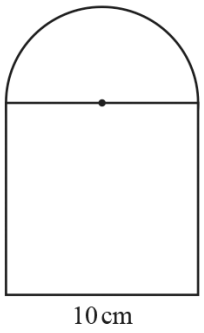
Find the value of k and the value of c.

k = ...

c = ... [3]

---

72. 0580_w17_QP_23 Q: 20



NOT TO SCALE

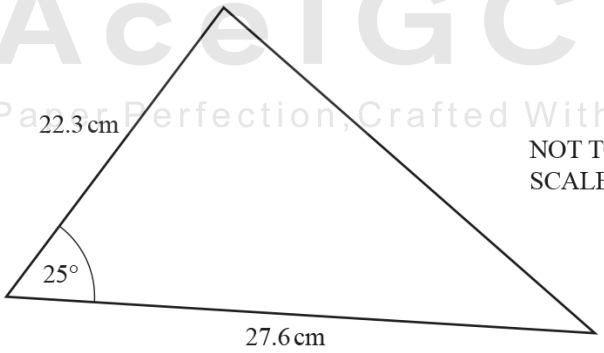
The diagram shows a shape made from a square and a semi-circle.

Calculate the area of the shape.
Give the units of your answer.

....[5]

---

73. 0580_m16_QP_22 Q: 7



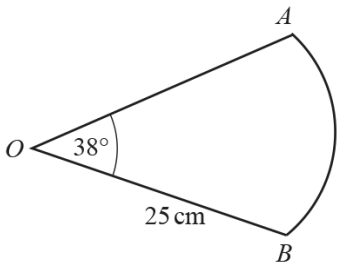
NOT TO SCALE

Calculate the area of this triangle.

..... cm^2 [2]

---

74. 0580_m16_QP_22 Q: 11



NOT TO SCALE

The diagram shows a sector of a circle, centre O, radius 25 cm.
The sector angle is 38°.

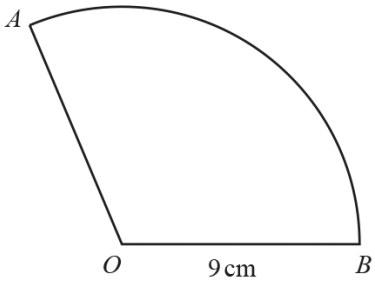
Calculate the length of the arc AB.
Give your answer correct to 4 significant figures.

AB = ... cm [3]

75. 0580_s16_QP_21 Q: 20

AB is an arc of a circle, centre *O*, radius 9 cm.
The length of the arc *AB* is 6π cm.
The area of the sector *AOB* is $k\pi$ cm^2.

Find the value of *k*.

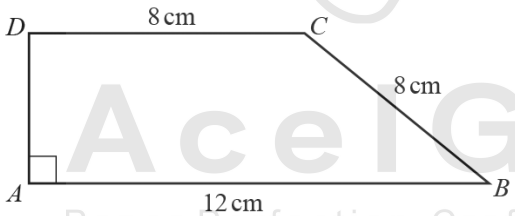


NOT TO SCALE

k = ... [3]

---

76. 0580_s16_QP_21 Q: 23



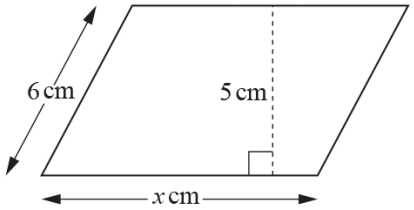
NOT TO SCALE

Calculate the area of this trapezium.

..... cm^2 [4]

---

77. 0580_s16_QP_23 Q: 3



NOT TO SCALE

The area of this parallelogram is 51.5 cm^2.

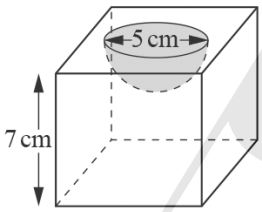
Work out the value of x.

x = ... [2]

---

78. 0580_s16_QP_23 Q: 15

A solid consists of a metal cube with a hemisphere cut out of it.



NOT TO SCALE

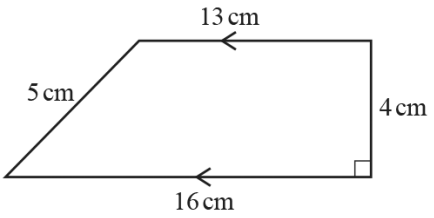
The length of a side of the cube is 7 cm.
The diameter of the hemisphere is 5 cm.

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

..... cm^3 [3]

---

79. 0580_w16_QP_22 Q: 4

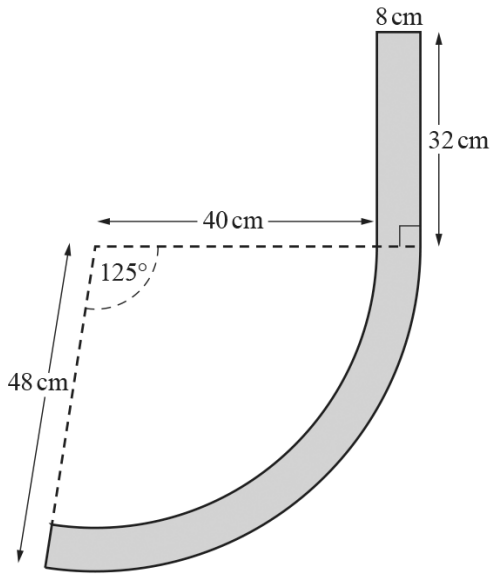


NOT TO SCALE

Calculate the area of this trapezium.

..... cm^2 [2]

80. 0580_w16_QP_22 Q: 17



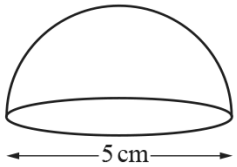
NOT TO SCALE

The diagram shows the cross section of part of a park bench.
It is made from a rectangle of length 32 cm and width 8 cm and a curved section.
The curved section is made from two concentric arcs with sector angle 125°.
The inner arc has radius 40 cm and the outer arc has radius 48 cm.

Calculate the area of the cross section correct to the nearest square centimetre.

..... cm^2 [5]

81. 0580_w16_QP_23 Q: 12



NOT TO SCALE

The diagram shows a hemisphere with diameter 5 cm.

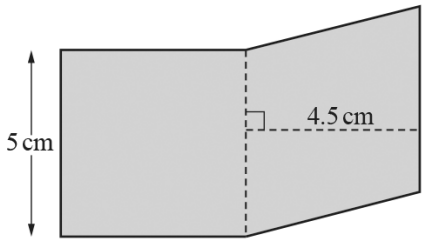
Calculate the volume of this hemisphere.

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

..... cm^3 [2]

82. 0580_w16_QP_23 Q: 14

The shaded shape is made by joining a square and a rhombus.



NOT TO SCALE

Work out

(a) the perimeter of the shaded shape,

..... cm [1]

(b) the area of the shaded shape.

..... cm^2 [2]

83. 0580_m15_QP_22 Q: 3

The base of a rectangular tank is 1.2 metres by 0.9 metres.
The water in the tank is 53 **centimetres** deep.

Calculate the number of litres of water in the tank.

Answer ..... litres [2]

---

84. 0580_P15_QP_20 Q: 5

A circle has a radius of 50 cm.

(a) Calculate the area of the circle in cm^2.

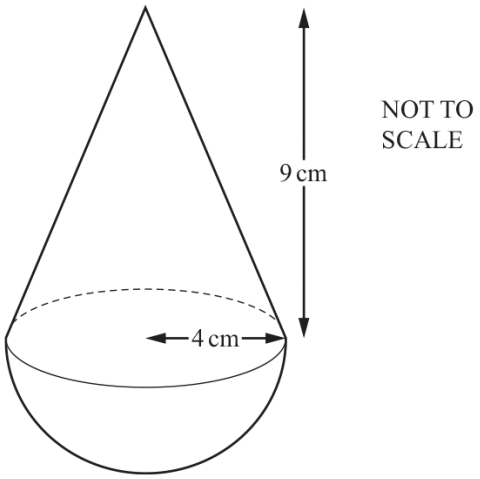
Answer(a) ..... cm^2 [2]

(b) Write your answer to **part (a)** in m^2.

Answer(b) ..... m^2 [1]

---

85. 0580_s15_QP_21 Q: 21



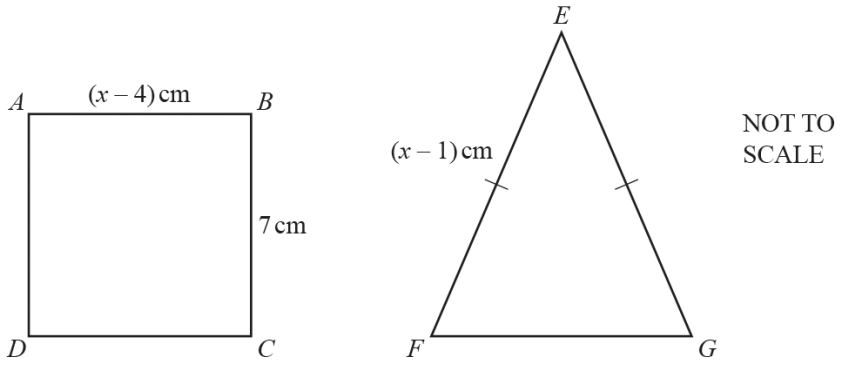
The diagram shows a toy.
The shape of the toy is a cone, with radius 4 cm and height 9 cm, on top of a hemisphere with radius 4 cm.

Calculate the volume of the toy.
Give your answer correct to the nearest cubic centimetre.

[The volume, V, of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]
[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

Answer ..... cm^3 [4]

86. 0580_s15_QP_22 Q: 13



(a) *ABCD* is a square.

Find the value of x.

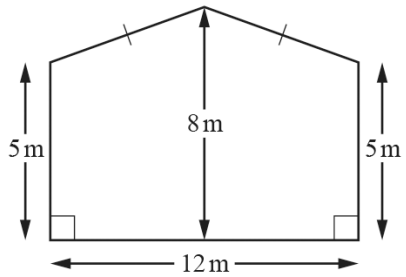
Answer(a) x = ... [1]

(b) Square *ABCD* and isosceles triangle *EFG* have the same perimeter.

Work out the length of *FG*.

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

87. 0580_s15_QP_22 Q: 18



NOT TO SCALE

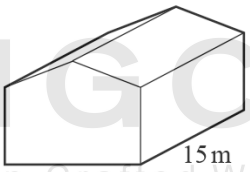
The diagram shows the front face of a barn.
The width of the barn is 12 m.
The height of the barn is 8 m.
The sides of the barn are both of height 5 m.

(a) Work out the area of the front face of the barn.

Answer(a) ..... m^2 [3]

(b) The length of the barn is 15 m.

Work out the volume of the barn.



NOT TO SCALE

Answer(b) ..... m^3 [1]

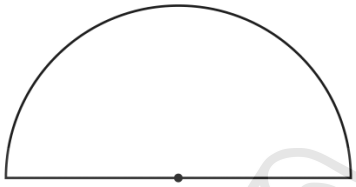
88. 0580_s15_QP_23 Q: 15

The circumference of a circle is 30 cm.

(a) Calculate the radius of the circle.

Answer(a) ..... cm [2]

(b)

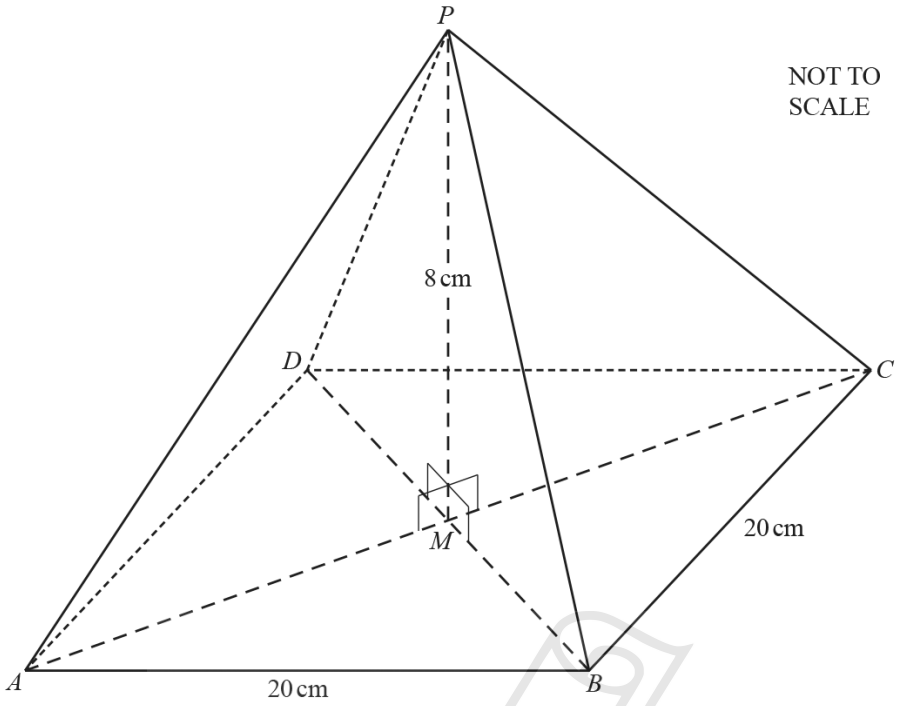


The length of the arc of the semi-circle is 15 cm.

Calculate the area of the semi-circle.

Answer(b) ..... cm^2 [2]

89. 0580_s15_QP_23 Q: 18

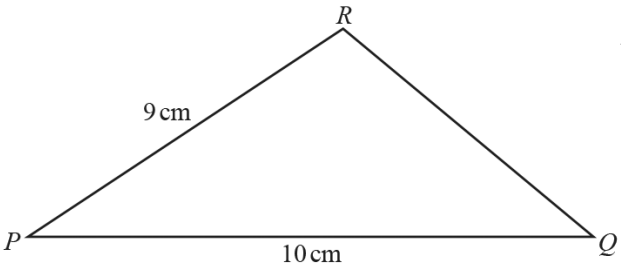


The diagram shows a solid pyramid on a square horizontal base $ABCD$.
The diagonals AC and BD intersect at M.
P is vertically above M.
$AB = 20$ cm and $PM = 8$ cm.

Calculate the total surface area of the pyramid.

Answer ..... cm^2 [5]

90. 0580_s15_QP_23 Q: 20



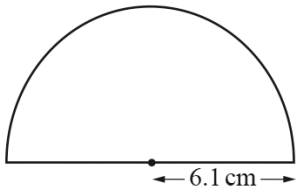
The area of triangle PQR is $38.5\,cm^2$.

Calculate the length QR.

Answer QR = ... cm [6]

---

91. 0580_w15_QP_21 Q: 11



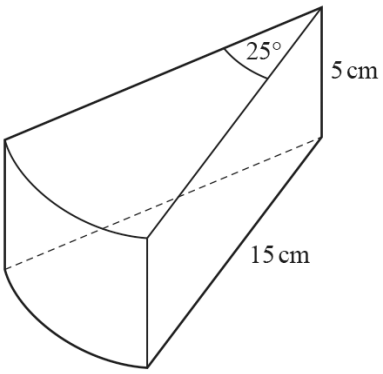
NOT TO SCALE

A protractor is a semi-circle of radius 6.1 cm.

Calculate the **perimeter** of the protractor.

Answer ..... cm [3]

92. 0580_w15_QP_21 Q: 19



NOT TO SCALE

The diagram shows a wooden prism of height 5 cm.
The cross section of the prism is a sector of a circle with sector angle 25°.
The radius of the sector is 15 cm.

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

Answer ..... cm^2 [5]

93. 0580_w15_QP_22 Q: 5

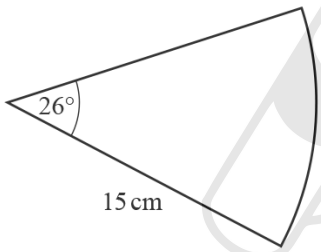
Calculate the volume of a hemisphere with radius 5 cm.

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

Answer ..... cm^3 [2]

---

94. 0580_w15_QP_22 Q: 16



NOT TO SCALE

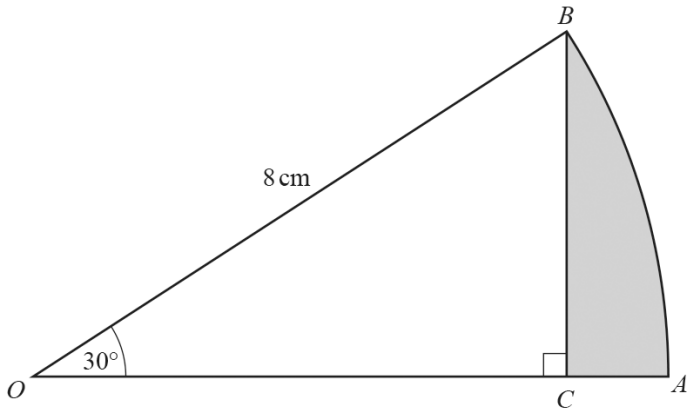
The diagram shows a sector of a circle with radius 15 cm.

Calculate the perimeter of this sector.

Answer ..... cm [3]

---

95. 0580_w15_QP_23 Q: 25



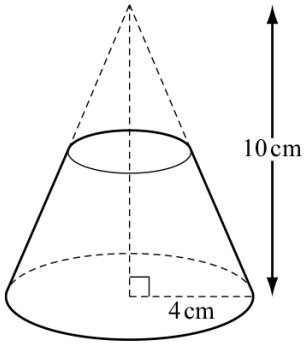
NOT TO SCALE

OAB is the sector of a circle, centre *O*, with radius 8 cm and sector angle 30°.
BC is perpendicular to *OA*.

Calculate the area of the region shaded on the diagram.

Answer ..... cm^2 [5]

96. 0580_s14_QP_21 Q: 18



NOT TO SCALE

A **solid** cone has base radius 4 cm and height 10 cm.
A mathematically similar cone is removed from the top as shown in the diagram.
The volume of the cone that is removed is $\frac{1}{8}$ of the volume of the original cone.

(a) Explain why the cone that is removed has radius 2 cm and height 5 cm.

Answer(a)

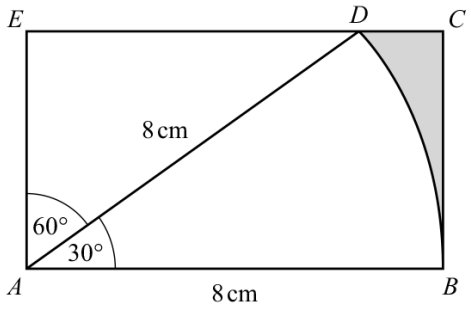
[2]

(b) Calculate the volume of the remaining solid.

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

Answer(b) ..... cm^3 [4]

97. 0580_s14_QP_21 Q: 19



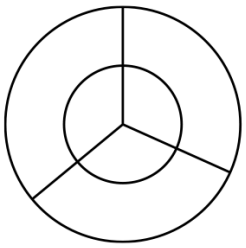
NOT TO SCALE

The diagram shows a rectangle *ABCE*.
D lies on *EC*.
DAB is a sector of a circle radius 8 cm and sector angle 30°.

Calculate the area of the shaded region.

Answer ..... cm^2 [7]

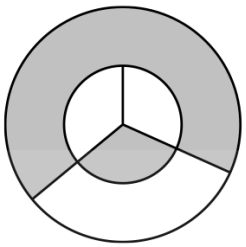
98. 0580_s14_QP_23 Q: 21



NOT TO SCALE

The diagram shows two concentric circles and three radii.
The diagram has rotational symmetry of order 3.

A club uses the diagram for its badge with some sections shaded.
The radius of the large circle is 6 cm and the radius of the small circle is 4 cm.



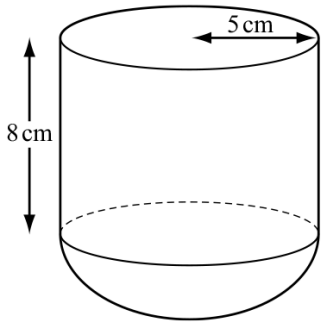
NOT TO SCALE

Calculate the total perimeter of the shaded area.

Answer ..... cm [5]

99. 0580_w14_QP_21 Q: 17

The diagram shows a child's toy.



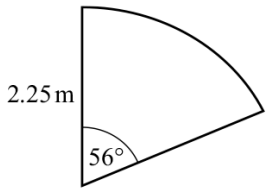
NOT TO SCALE

The shape of the toy is a cylinder of radius 5 cm and height 8 cm on top of a hemisphere of radius 5 cm.

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

Answer ..... cm^3 [5]

100. 0580_w14_QP_22 Q: 14



NOT TO SCALE

The diagram shows a sand pit in a child's play area.
The shape of the sand pit is a sector of a circle of radius 2.25 m and sector angle 56°.

(a) Calculate the area of the sand pit.

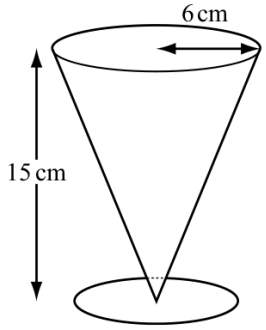
Answer(a) ..... m^2 [2]

(b) The sand pit is filled with sand to a depth of 0.3 m.

Calculate the volume of sand in the sand pit.

Answer(b) ..... m^3 [1]

101. 0580_w14_QP_23 Q: 18



NOT TO SCALE

The diagram shows a glass, in the shape of a cone, for drinking milk.
The cone has a radius of 6 cm and height 15 cm.
A bottle of milk holds 2 litres.

(a) How many times can the glass be completely filled from the bottle?
[The volume, V, of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

Answer(a) ..... [4]

(b) Calculate the volume of milk left in the bottle.
Give your answer in cm^3.

Answer(b) ..... cm^3 [3]

102. 0580_s13_QP_21 Q: 15

A sphere has a volume of $80\,\text{cm}^3$.

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

Answer ..... cm [3]

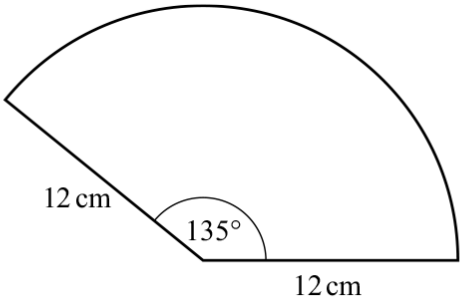
103. 0580_s13_QP_21 Q: 16

A water pipe has a circular cross section of radius 0.75 cm.
Water flows through the pipe at a rate of 16 cm/s.

Calculate the time taken for 1 litre of water to flow through the pipe.

Answer ..... s [3]

104. 0580_s13_QP_21 Q: 21



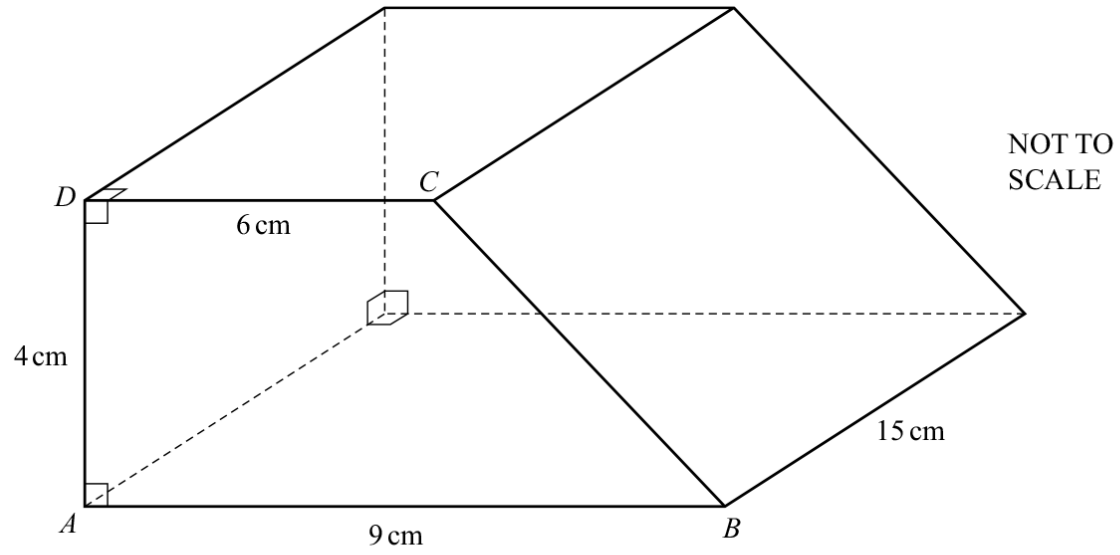
NOT TO SCALE

The diagram shows a sector of a circle of radius 12 cm with an angle of 135°.

Calculate the perimeter of the sector.

Answer ..... cm [3]

105. 0580_s13_QP_21 Q: 26

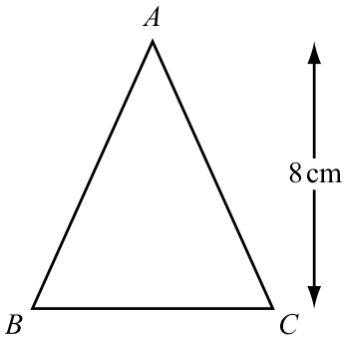


The diagram shows a solid prism of length 15 cm.
The cross section of the prism is the trapezium $ABCD$.
Angle DAB = angle CDA = 90°.
AB = 9 cm, DC = 6 cm and AD = 4 cm.

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

Answer ..... cm^2 [5]

106. 0580_s13_QP_22 Q: 5



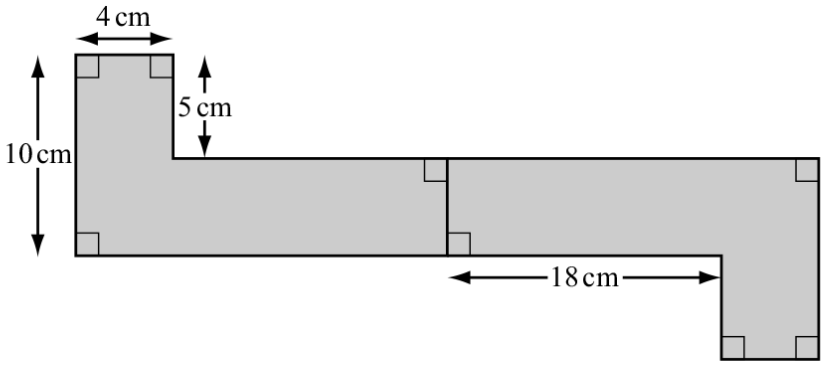
NOT TO SCALE

Triangle ABC has a height of 8 cm and an area of 42 cm^2.

Calculate the length of BC.

Answer BC = ... cm [2]

107. 0580_s13_QP_23 Q: 7



NOT TO SCALE

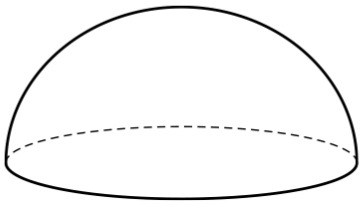
The shaded shape has rotational symmetry of order 2.

Work out the shaded area.

Answer ..... cm^2 [3]

108. 0580_w13_QP_21 Q: 18

The diagram shows a solid hemisphere.



The **total** surface area of this hemisphere is 243π.
The volume of the hemisphere is $k\pi$.

Find the value of k.

[The surface area, A, of a sphere with radius r is $A = 4\pi r^2$.]
[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

Answer $k =$ ..... [4]

109. 0580_w13_QP_21 Q: 19

(a) Convert 144 km/h into metres per second.

Answer(a) ..... m/s [2]

(b) A train of length 120 m is travelling at 144 km/h.
It passes under a bridge of width 20 m.

Find the time taken for the whole train to pass under the bridge.
Give your answer in seconds.

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

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110. 0580_w13_QP_22 Q: 3

Find the circumference of a circle of radius 2.5 cm.

Answer ..... cm [2]

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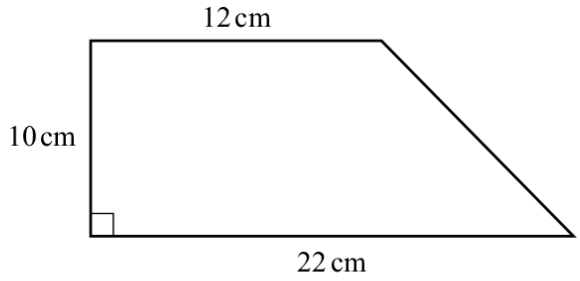
111. 0580_w13_QP_22 Q: 7



NOT TO SCALE

Find the area of the trapezium.

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

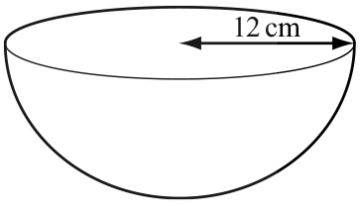
---

112. 0580_w13_QP_22 Q: 8

A **hemisphere** has a radius of 12 cm.

Calculate its volume.

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



Answer ..... cm^3 [2]

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113. 0580_w13_QP_23 Q: 5

Write

(a) 60 square metres in square centimetres,

Answer(a) ..... cm^2 [1]

(b) 22 metres per second in kilometres per hour.

Answer(b) ..... km/h [2]

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114. 0580_s12_QP_22 Q: 5

A lake has an area of 63 800 000 000 square metres.

Write this area in square kilometres, correct to 2 significant figures.

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

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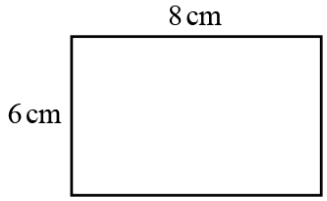
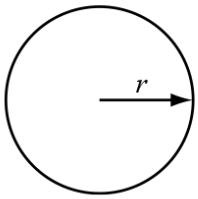
115. 0580_s12_QP_22 Q: 7





NOT TO SCALE

The perimeter of the rectangle is the same length as the circumference of the circle.

Calculate the radius, r, of the circle.

Answer $r =$ ..... cm [3]

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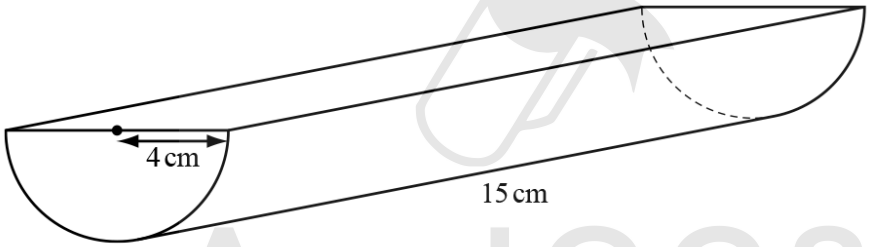
116. 0580_s12_QP_23 Q: 16



NOT TO SCALE

The diagram shows a **solid** prism of length 15 cm.
The cross-section of the prism is a semi-circle of radius 4 cm.

Calculate the total surface area of the prism.

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

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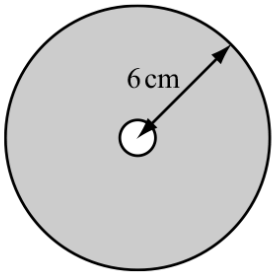
117. 0580_w12_QP_21 Q: 12



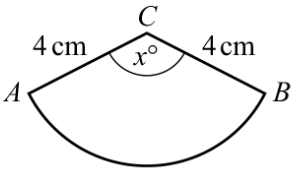
NOT TO SCALE

The diagram shows a circular disc with radius 6 cm.
In the centre of the disc there is a circular hole with radius 0.5 cm.

Calculate the area of the shaded section.

Answer ..... cm^2 [3]

118. 0580_w12_QP_21 Q: 14



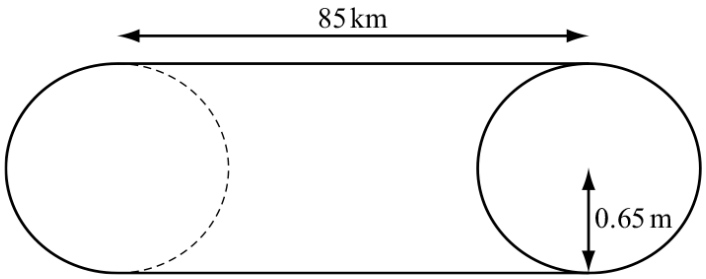
NOT TO SCALE

ABC is a sector of a circle, radius 4 cm and centre *C*.
The length of the arc *AB* is 8 cm and angle $ACB = x°$.

Calculate the value of x.

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

119. 0580_w12_QP_22 Q: 8



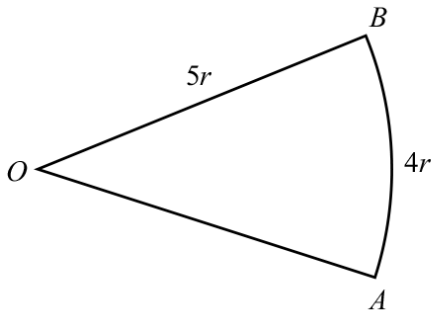
NOT TO SCALE

A water pipeline in Australia is a cylinder with **radius** 0.65 **metres** and length 85 **kilometres**.

Calculate the volume of water the pipeline contains when it is full.
Give your answer in cubic metres.

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

120. 0580_w12_QP_23 Q: 17



NOT TO SCALE

The diagram shows a sector of a circle, centre O, radius $5r$.
The length of the arc AB is $4r$.

Find the area of the sector in terms of r, giving your answer in its simplest form.

Answer ..... [3]