

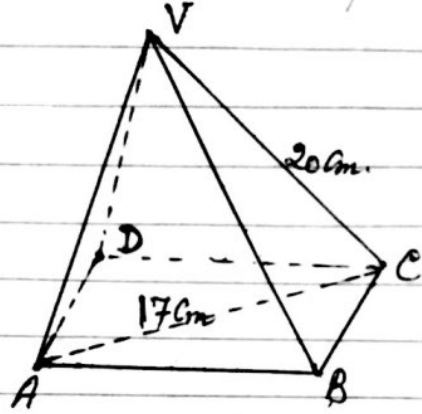
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IG-Maths
0580

Mensuration
Exercise
Paper-2

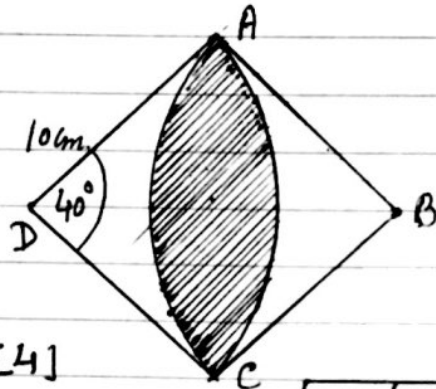
(Suresh Goel)

Q1 The diagram shows a pyramid with a square base ABCD. All the sloping edges of the pyramid are 20 cm long and $AC = 17$ cm. Calculate the height of the pyramid. --- [3]



M-17/22/Q9

Q2 ABCD is a rhombus with side length 10 cm. Angle $ADC = 40^\circ$. DAC is a sector of a circle with centre D. BAC is a sector of a circle centre B. Calculate the shaded area --- [4]

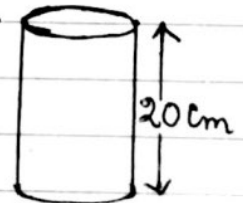


S-17/21/Q19

Q3 Calculate the volume of a hemisphere with radius 3.2 cm. --- [2]

S-17/23/Q5

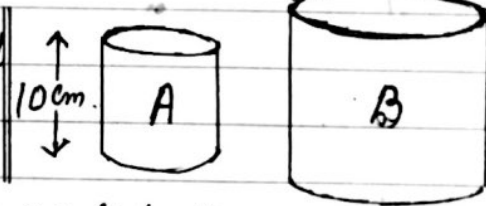
Q4 (a) A cylinder has height 20 cm. The area of circular cross section is 74 cm^2 . Work out the volume of this cylinder. --- [1]



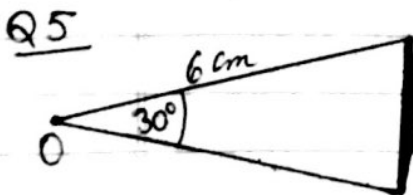
(b) Cylinder A is mathematically similar to cylinder B.

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. --- [3]



W-17/21/Q20

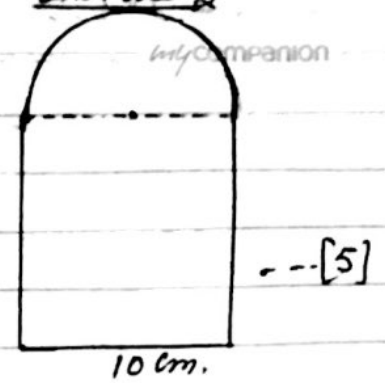


The diagram shows a sector of a circle, centre O and radius 6 cm. The sector angle is 30° . --- [3]

The area of the shaded segment is $(k\pi - c) \text{ cm}^2$, where k and c are integers. Find the value of k and the value of c .

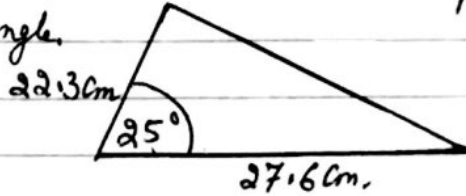
W-17/22/Q3

Q6 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.



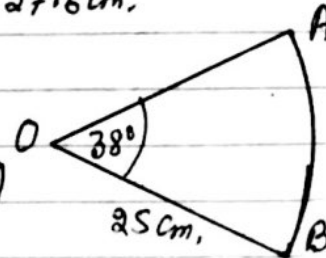
W-17/23/Q20

Q7 Calculate the area of this triangle.



M-16/22/Q7

Q8 The diagram shows a sector of a circle, centre O, radius 25 cm. The sector angle is 38° .

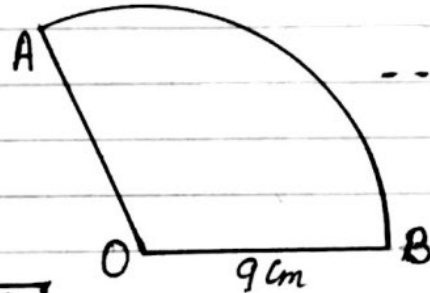


Calculate the length of the arc AB.

Give your answer correct to 4 significant figures.

M-16/22/Q11

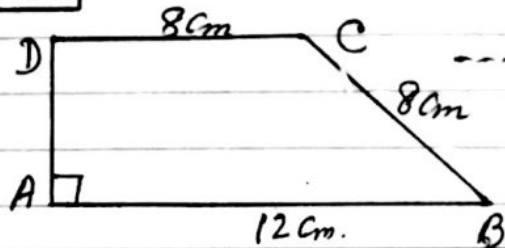
Q9 AB is an arc of a circle, centre O, radius 9 cm. The length of the arc AB is 6π cm. The area of sector AOB is $k\pi$ cm².



Find the value of k.

S-16/21/Q20

Q10 Calculate the area of this trapezium.



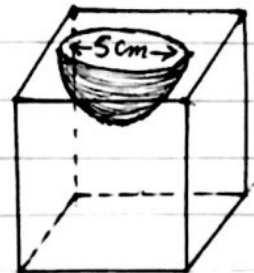
S-16/21/Q23

Q11 A solid consists of a metal cube with a hemisphere cut out of it.

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.



S-16/23/Q15

Q12 The diagram shows the cross section of part of a park bench. It is made from a rectangle of length 32cm and width 8cm and a curved section. The curved section is made from two concentric arcs with arcs with sector angle 125° . The inner arc has a radius 40cm and the outer arc has radius 48cm. Calculate the area of cross-section correct to the nearest square centimetre.

W-16/22/Q17 [5]

Q13 The diagram shows a hemisphere with diameter 5 cm. Calculate the volume of this hemisphere.

W-16/23/Q12 [2]

Q14 The shaded shape is made by joining a square and a rhombus. Work out.

(a) the perimeter of the shaded shape, ... [1]
 (b) the area of the shaded shape, ... [2]

W-16/23/Q14

Q15 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.

M-15/22/Q3 [2]

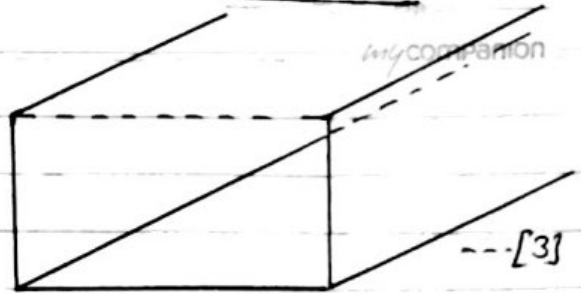
Q16 The diagram show a toy. The shape of the toy is a cone, with radius 4cm and height 9cm, on the top of a hemisphere with radius 4cm. Calculate the Volume of the toy, Give your answer correct to the nearest centimetre.

S-15/21/Q21 [4]

Q17(a) ABCD is a square. Find the Value of x . A $(x-4)$ cm D
 (b) Square ABCD and isosceles triangle EFG have same perimeter. Work out the length of FG. E $(x-1)$ cm F G

S-15/22/Q13 [1] [2]

Q18 The diagram shows a channel for water. The channel lies on horizontal ground. This channel has a constant rectangular cross section with area 0.95 m^2 . The channel is full and the water flows through the channel at a rate of 4 metres/minute. Calculate the number of cubic metres of water that flow along the channel in 3 hours.

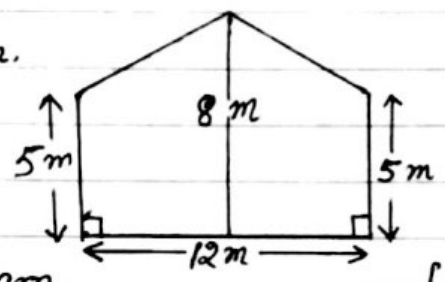


my companion

--- [3]

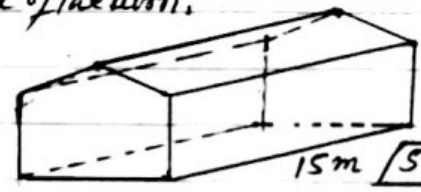
S-15/22/Q14

Q19 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.



--- [3]

- (a) Work out the area of the front face of the barn.
- (b) The length of the barn is 15 m. Work out the volume of the barn.

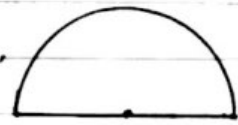


--- [1]

S-15/22/Q18

Q20 The circumference of a circle is 30 cm.

- (a) Calculate the radius of the circle.
- (b) The length of the arc of the semicircle is 15 cm. Calculate the area of the semicircle.

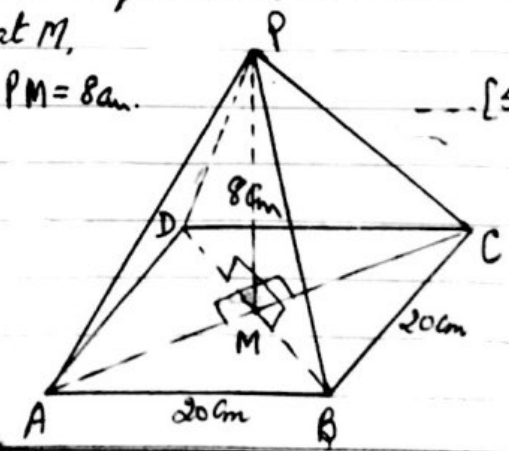


--- [2]

--- [2]

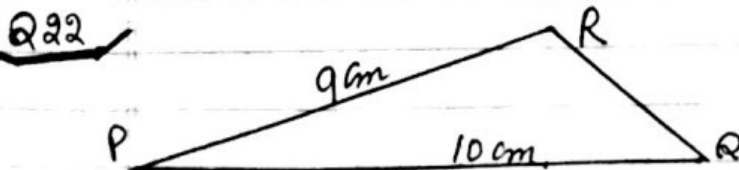
S-15/23/Q15

Q21 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. $AB = 20 \text{ cm}$ and $PM = 8 \text{ cm}$. Calculate the total surface area of the pyramid.



--- [5]

S-15/23/Q18



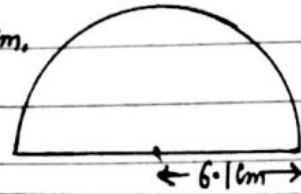
The area of triangle PQR is 38.5 cm^2 . Calculate the length QR.

S-15/23/Q20

--- [6]

Q23

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

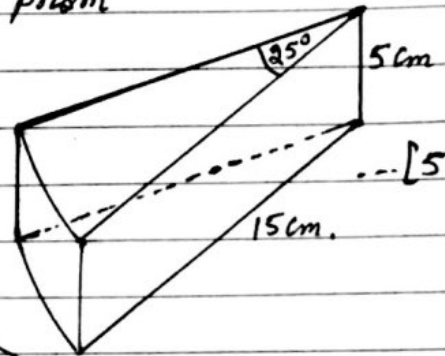


---[3]

W-15/21/Q11

Q24

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



---[5]

W-15/21/Q19

Q25

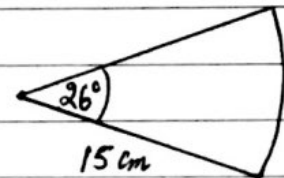
Calculate the volume of a hemisphere with radius 5cm.

W-15/22/Q5

---[2]

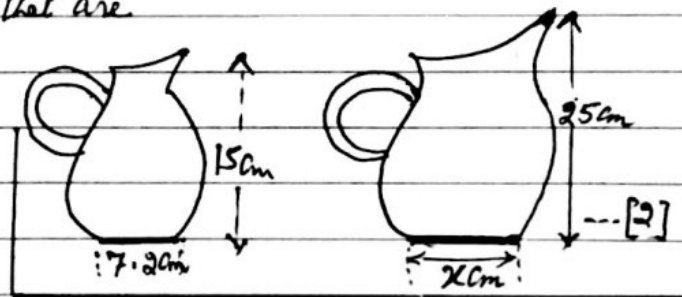
Q26

The diagram shows a sector of a circle with radius 15cm. Calculate the perimeter of this sector.



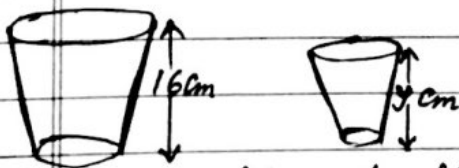
W-15/22/Q16

27 (a) The diagram shows two jugs that are mathematically similar. Find the value of x .



---[2]

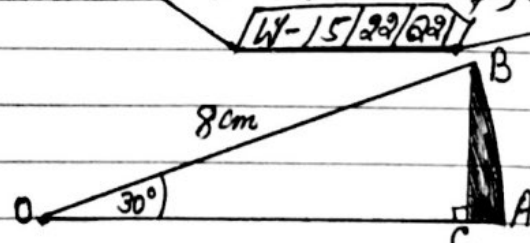
(b)



The diagram shows two glasses that are mathematically similar. The height of the larger glass is 16cm and its volume is 375 cm^3 . The height of the smaller glass is $y \text{ cm}$ and its volume is 192 cm^3 . Find the value of y .

---[3]

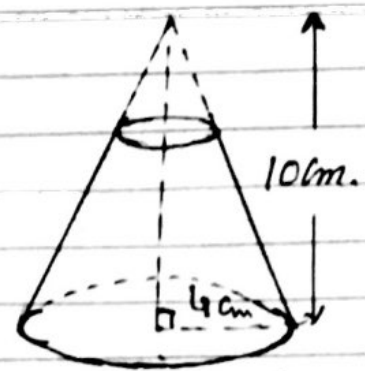
Q28. OAB is the sector of a circle, with radius 8 cm and sector angle 30° . BC is perpendicular to OA. Calculate the area of the region shaded on the diagram.



---[5]

W-15/23/Q25

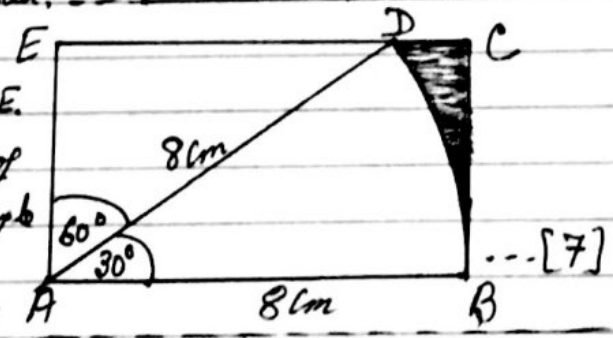
Q29 A Solid cone has base radius 4cm and height 10cm. A mathematically similar cone is removed from the top as shown in the diagram. The volume of the cone that is removed is $\frac{1}{8}$ of the volume of the original cone.



- (a) Explain why the cone that is removed has radius 2cm and height 5cm. ---[2]
- (b) Calculate the volume of the remaining solid. ---[4]

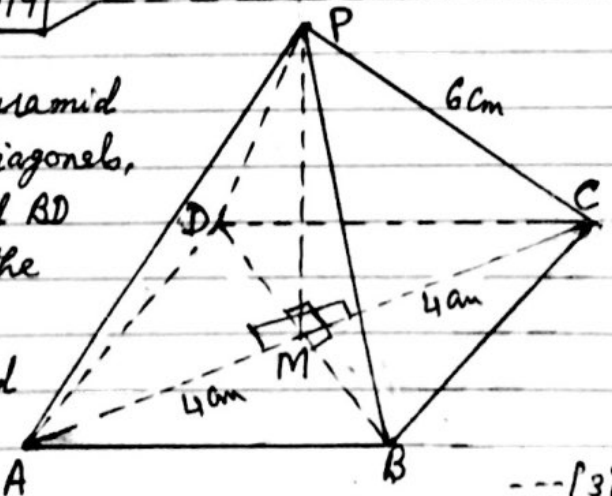
S-14/21/Q18

Q30 The diagram shows a rectangle ABCE. D lies on EC. DAB is a sector of a circle radius 8cm and sector angle 30° . Calculate the area of the shaded region.



S-14/21/Q19

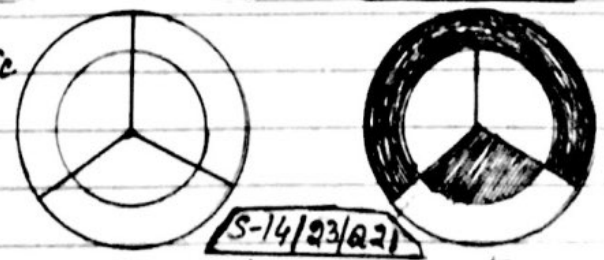
Q31 The diagram shows a square pyramid on a square base ABCD with diagonals AC and BD of length 8cm. AC and BD meet at M and the vertex, P, of the pyramid is vertically above M. The sloping edges of the pyramid are of length 6cm. Calculate,



- (a) the perp. height, PM, of the pyramid. ---[3]
- (b) the angle between a sloping edge and base of the pyramid. ---[3]

S-14/22/Q21

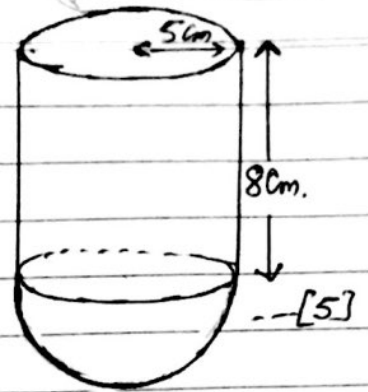
Q32 The diagram shows two concentric circles and three radii. The diagram has rotational symmetry of order 3.



S-14/23/Q21

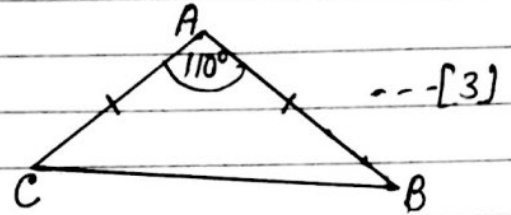
A club uses the diagram for its badge with some sections... shaded. The radius of the large circle is 6cm, and the radius of the small circle is 4cm. Calculate the total perimeter of the shaded area. ---[5]

Q33 The diagram shows a child's toy.
The shape of the toy is a cylinder of radius 5cm and height 8cm on the top of a hemisphere of radius 5cm.
Calculate the volume of the toy.



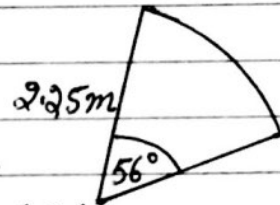
W-14/21/Q17

Q34 Triangle ABC is isosceles with $AB = AC$.
Angle $BAC = 110^\circ$ and the area of the triangle is 85 cm^2 .
Calculate AC.



W-14/22/Q13

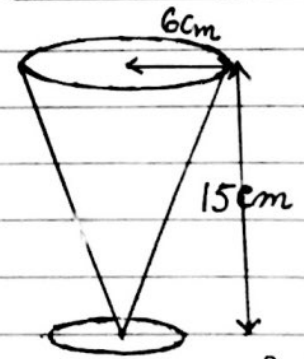
Q35 The diagram shows a sand pit in a child's play area. The shape of the sand pit is a sector of a circle of radius 2.25m and sector angle 56° .



(a) Calculate the area of the sand pit. --- [2]
(b) The sand pit is filled with sand to a depth of 0.3m. --- [1]
Calculate the volume of sand in the sand pit.

W-14/22/Q14

Q36 The diagram shows a glass, in the shape of a cone, for drinking milk. The cone has a radius of 6cm and height 15cm. A bottle of milk holds 2 litres.



(a) How many times can the glass be completely filled from the bottle? --- [4]
(b) Calculate the volume of milk left in the bottle. Give your answer in cm^3 .

W-14/23/18

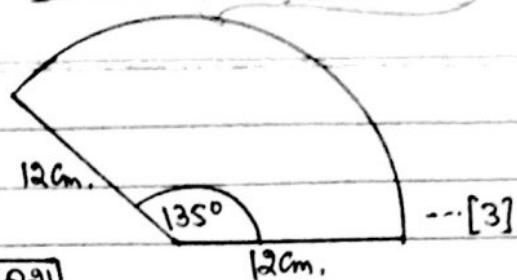
Q37 A sphere has a volume of 80 cm^3 . Calculate the radius of the sphere. --- [3]

S-13/21/Q15

Q38 A water pipe has a circular cross section of radius 0.75cm. Water flows through the pipe at a rate of 16cm/sec. Calculate the time taken for 1 litre of water to flow through the pipe. --- [3]

S-13/21/Q16

Q39 The diagram shows a sector of a circle of radius 12cm, with an angle of 135° .

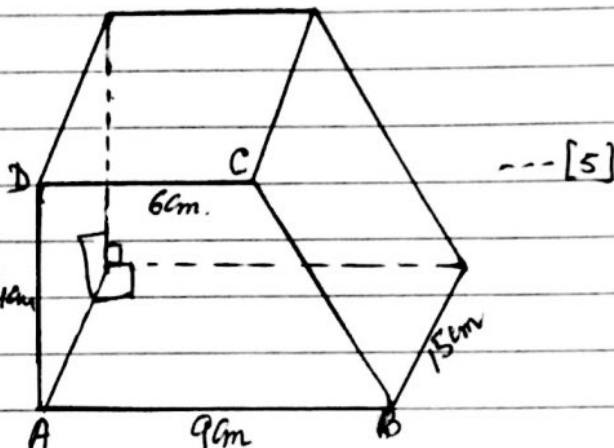


Calculate the perimeter of the sector. [S-13/21/Q39]

Q40 Diagram shows a solid prism of length 15cm. The cross section of the prism is the trapezium ABCD.

Angle $DAB = \text{angle } CDA = 90^\circ$
 $AB = 9\text{cm}$, $DC = 6\text{cm}$ and $AD = 4\text{cm}$,

Calculate the total surface area of the prism.



[S-13/21/Q26]

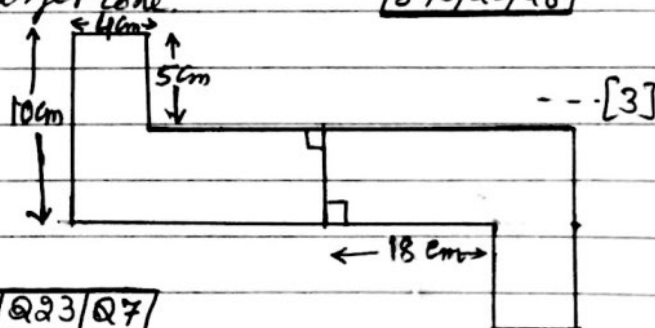
Q41 The volumes of two similar cones are $36\pi\text{ cm}^3$ and $288\pi\text{ cm}^3$.

The base radius of the smaller cone is 3cm.

Calculate the base radius of the larger cone.

[S-13/23/Q6]

Q42 The shaded shape has rotational symmetry of order 2. Work out the shaded area.

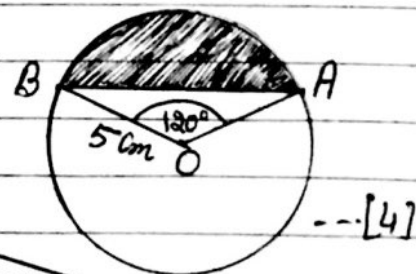


[S-13/Q23/Q7]

Q43 A and B lie on a circle centre O, radius 5cm.

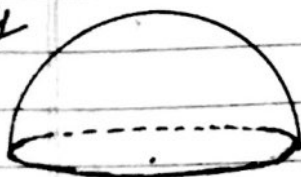
Angle $AOB = 120^\circ$.

Find the area of the shaded segment.



[S-13/23/Q18]

Q44



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.

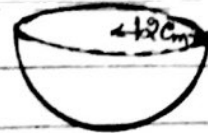
[W-13/21/Q18]

Q45 Find the circumference of a circle of radius 2.5cm.

[N-13/23/Q3]

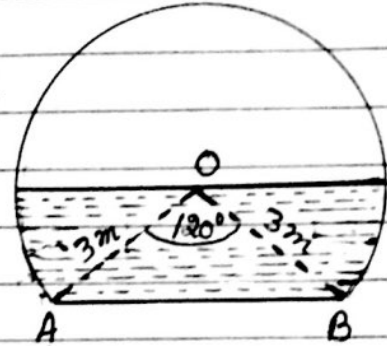
Q46 A hemisphere has a radius of 12cm.
Calculate its volume.

W-13/22/Q8



--- [2]

Q47 The diagram shows the entrance to a tunnel.
The circular arc has a radius of 3cm and centre O.
AB is horizontal and angle AOB = 120°
During a storm the tunnel filled with
water, to the level shown by the shaded area
in the diagram.



(a) Calculate the shaded area.

--- [4]

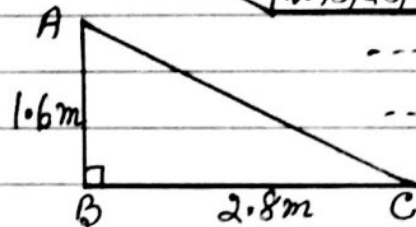
(b) The tunnel is 50m long. Calculate the volume of water in the tunnel.

--- [1]

W-13/23/Q16

Q48 (a) Find the area of triangle ABC.
(b) Calculate AC.

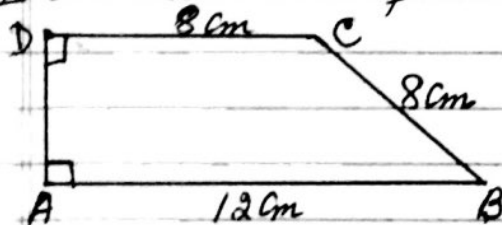
M-18/22/Q16



--- [2]

--- [2]

Q49 Calculate the area of this trapezium.

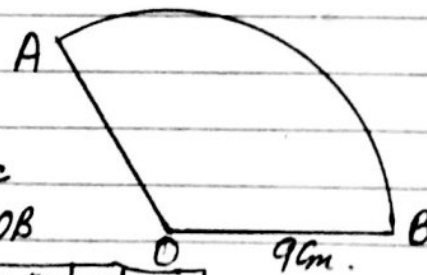


--- [4]

SP-2020/02/Q17

Q50 AB is an arc of a circle,
Centre O, radius 9cm. The length of arc
AB is 6π cm. The area of sector AOB
is $k\pi$ cm². Find the value of k.

SP-2020/02/Q23



--- [3]

Q51 A circle has a radius of 50cm.

(a) Calculate the area of the circle in cm².

SP-15/02/Q5

(b) Write your answer to part (a) in m².

Answers

Q1. 18.1 cm.

Q2. 5.53 cm²

Q3. 68.6 cm³

Q4(a) 1480 cm³

(b) 30 cm.

Q5. k = 3 and c = 9

Q6. 139 cm²

Q7. 130 cm²

Q8. 16.58 cm.

Q9. 27

Q10. 69.3 cm²

Q11. 310 cm³

Q12. 1024 cm²

Q13. 32.7 cm³

Q14 (a) 30 cm (b) 47.5 cm²

Q15. 572.4 litres

Q16. 285 cm³

Q17(a) 11 (b) 8 cm.

Q18. 684 m³

Q19 (a) 78 m² (b) 1170 m³

Q20 (a) 4.77 cm (b) 35.7 cm²

Q21. 9/2 cm²

Q22. 9.37 cm

Q23. 31.4 cm

Q24. 281 cm²

Q25. 262 cm³

Q26. 36.8 cm²

Q27 (a) 12 cm (b) 12.8 cm.

Q28. 2.9 cm²

Q29 (a) correct Working (b) 147

Q30. 1.38 cm²

Q31 (a) 4.47 cm (b) 48.2°

Q32. 62.3 cm

Q33. 890 cm³

Q34. 13.5 cm

Q35 (a) 2.47 m² (b) 0.742 m³

Q36 (a) 3 (b) 303 cm³

Q37. 2.67 cm.

Q38. 35.4 sec.

Q39. 52.3 cm

Q40. 420 cm³

Q41. 6 cm.

Q42. 260 cm²

Q43. 15.4 cm²

Q44. 486

Q45. 15.7 cm.

Q46. 3619 cm³

Q47 (a) 8.61 m² (b) 430 m³

Q48 (a) 2.24 m² (b) 3.22 m

Q49. 69.3 cm²

Q50. 27

Q51 (a) 7853 cm²

(b) 0.7853 m²

