Solid Geometry

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2) June 2011 V1

8 Calculate the radius of a sphere with volume 1260 cm^3 [The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]



3) June 2011 V3

15 A cylinder has a height of 12 cm and a volume of 920 cm^3 .

Calculate the radius of the base of the cylinder.





The diagram shows a pyramid with a square base ABCD of side 6 cm.

The height of the pyramid, PM, is 4 cm, where M is the centre of the base.

Calculate the total surface area of the pyramid.

5) November 2011 V3

14



The sphere of radius r fits exactly inside the cylinder of radius r and height 2r. Calculate the percentage of the cylinder occupied by the sphere.

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

6) June 2	012 V3
16	NOT TO SCALE
	4cm 15cm
	The diagram shows a solid prism of length 15 cm. The cross-section of the prism is a semi-circle of radius 4 cm.
	<i>Answer</i> cm ² [4]
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7) November 2012 V2





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 m³ [3]

9) June 2013 V1

15 A sphere has a volume of 80 cm^3 .

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

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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.

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11) November 2013 V1

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]

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12) November 2013 V2

8	A hemisphere has a radius of 12 cm.
	[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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13) November 2013 V3

16 The diagram shows the entrance to a tunnel. The circular arc has a radius of 3 m and centre *O*. *AB* is horizontal and angle $AOB = 120^{\circ}$.



During a storm the tunnel filled with water, to the level shown by the shaded area in the diagram.

(a) Calculate the shaded area.

Answer(a) m^2 [4]

(**b**) The tunnel is 50 m long.

Calculate the volume of water in the tunnel.

Answer(*b*) m³ [1]

14) November 2014 V1

17 The diagram shows a child's toy.



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 $V = \frac{4}{3}\pi r^3$.]

14



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.

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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 cm³.

Answer(*b*) cm³ [3]



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 $V = \frac{4}{3}\pi r^3$.]

18) June 2015 V2









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.

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Answer cm² [5]

21) November 2015 V2

5 Calculate the volume of a hemisphere with radius 5 cm.

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



22) March 2015 V2

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.

Asver	litres [2]
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23) June 2016 V3 A solid consists of a metal cube with a hemisphere cut out of it. 15 -5 cm -NOT TO SCALE 4 7cm V. 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 $V = \frac{4}{3}\pi r^3$.] $cm^3[3]$ www.Q8Maths.com

24) November 2016 V3



26) June 2018 V2 14 NOT TO SCALE 1 cm 7 cm 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. 26) June 2018 V2 15 Find the volume of a cylinder of radius 5 cm and height 8 cm. Give the units of your answer.[3] www.Q8Maths.com

25) June 2013 V1

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.





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 m². 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

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