FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

G17: Circles and solids

Solve problems involving circles, spheres, cones and cylinders

20 marks · 25 minutes · Calculator allowed

1) A running track is a 100 m by 60 m rectangle with a semicircle on each short side. Find the distance once round the outside.

..... m

[Question 1: 3 marks]

2) A metal sphere of radius 6 cm is melted and made into cylinders of radius 2 cm and height 4 cm. How many cylinders can be made? ($V = \frac{4}{3}\pi r^3$)

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[Question 2: 4 marks]

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3) A cone has volume 100π cm^3 and radius 5 cm. Find its height and its exact curved surface area. ($V = \frac{1}{3}\pi r^2 h$, curved area πrl)

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[Question 3: 3 marks]

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4) A hemispherical bowl of radius 9 cm is full of water. The water is poured into a cylinder of radius 6 cm. How deep is the water?

..... cm

[Question 4: 3 marks]

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5) A circle has an area of 50 cm^2. Find its circumference.

..... cm

[Question 5: 3 marks]

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6) An ice-cream is a cone of radius 3 cm and height 10 cm with a hemisphere of ice-cream on top. Find its total volume.

..... cm^3

[Question 6: 2 marks]

7) A pipe is 100 cm long with outer radius 5 cm and inner radius 4 cm. Find the volume of material in the pipe.

..... cm^3

[Question 7: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	388.5	200 m straights (P1); circle of diameter 60 (P1); A1.
2	18	Sphere 288π (P1); cylinder 16π (P1, P1); 18 (A1).
3	12 cm; 65π	$\frac{25\pi h}{3} = 100\pi$ (P1); $h = 12$ (A1); $l = 13$, 65π (A1).
4	13.5	Hemisphere 486π (P1); $\div 36\pi$ (P1); A1.
5	25.1	$r = \sqrt{\frac{50}{\pi}} = 3.99$ (P1, P1); A1.
6	150.8	$30\pi + 18\pi$ (P1); A1.
7	2827	$100\pi(25 - 16)$ (P1); A1.