Oxford Revise | Edexcel GCSE Maths Foundation| Answers

Chapter 21 Circles, cylinders, cones, and spheres

Question	Answer	Extra information	Marks
21.1 (a)	Area = $\pi \times 9 = 28.2743...$ Area = 28.3 mm^2, to 3 sf	Correct calculation 9π or $28.2743....$ Answer correct to 3 sf	1 1 1
21.1 (b)	Circumference = 6π mm = 18.8 mm	Correct calculation 6π or $18.84\ldots$ Correct answer to 3 sf	1 1 1
21.2 (a)	Tangent		1
21.2 (b)	Segment		1
21.3 (a)	Area = $\pi \times 4^2 = 16\pi$ cm^2		1
21.3 (b)	Circumference = 8π cm		1
21.4	Area = 25π, therefore the radius = 5 cm Circumference is then 10π cm	Use $\pi r^2 = 25\pi$ to find the radius $r = 5$ Correct answer	1 1 1
21.5 (a)	Area = $\frac{\pi \times 4.5^2}{2} = 31.8$ cm^2	$\frac{\pi \times 4.5^2}{2}$ Answer correct to 1 dp	1 1

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Question	Answer	Extra information	Marks
21.5 (b)	Perimeter $= \frac{\pi d}{2} + d = \frac{\pi \times 9}{2} + 9 = 23.1$ cm	$\frac{\pi d}{2} + d$ Answer correct to 1 dp	1 1
21.6 (a)	Area $= \pi \times 13^2 \times \frac{200}{360} = 295.0$ cm^2 (1 dp)	Correct formula Answer correct to 1 dp	1 1
21.6 (b)	Arc length $= 2 \times \pi \times 13 \times \frac{200}{360} = 45.4$ cm (1 dp)	Correct formula Answer correct to 1 dp	1 1
21.7 (a)	$60°$		1
21.7 (b)	Area of one sector $= \frac{1}{6}\pi r^2 = \frac{1}{6}\pi \times 18^2 = 54\pi$ cm^2	$\pi \times 18^2 \times \frac{60}{360}$ to find area of one sector Correct answer (accept 170 cm^2 and 169.6 cm^2)	1 1
21.8 (a)	Volume $= \pi \times 4^2 \times 11 = 176\pi = 552.9$ cm^3	$\pi \times 4^2 \times 11$ Correct answer	1 1
21.8 (b)	Curved surface area $= 11 \times 8\pi = 88\pi = 276.5$ cm^2	Formula for curved surface area Correct answer	1 1

Question	Answer	Extra information	Marks
21.9	Large semi-circular diameter $= 19.3 + 4.9 = 24.2$ m Perimeter $= \frac{4.9\pi}{2} + \frac{19.3\pi}{2} + \frac{24.2\pi}{2} = 76.0$ m	$\frac{4.9\pi}{2}$ or $\frac{19.3\pi}{2}$ or $\frac{24.2\pi}{2}$ Adding perimeters of all three semicircles Correct answer	1 1 1
21.10 (a)	Volume $= \frac{4}{3}\pi r^3 = \frac{4}{3}\pi \times 18.2^3 = 25\,252.4$ cm^3	Correct formula Correct answer to 1 dp	1 1
21.10 (b)	Surface area $= 4\pi r^2 = 4\pi \times 18.2^2 = 4162.5$ cm^2	Correct formula Correct answer to 1 dp	1 1
21.11	$\text{Surface area} = 400\pi = 4\pi \times r^2$ $100 = r^2$ $r = 10$ Radius is 10 cm	$4\pi r^2 = 400\pi$ or $r^2 = 100$ Correct answer	1 1
21.12 (a)	Volume $= \frac{1}{3}\pi \times 10^2 \times 24 = 800\pi$ cm^3	$\frac{1}{3}\pi \times 10^2 \times 24$ Correct answer	1 1

Question	Answer	Extra information	Marks
21.12 (b)	Curved surface area $= \pi \times 10 \times 26 = 260\pi$ Base area $= \pi \times 10^2 = 100\pi$ Total area $= 360\pi$ cm^2	$\pi \times 10 \times 26$ $\pi \times 10^2$ Correct answer	1 1 1
21.13	Area of the square base $= 230^2$ Volume $= \frac{1}{3} \times 230^2 \times 147 = 2\,592\,100$ Volume $= 2\,600\,000$ m^3 (2 sf)	230^2 $\frac{1}{3} \times 230^2 \times 147$ Correct answer	1 1 1
21.14	Curved surface area $= 21\pi = \pi \times r \times 7$ $r = 3$ Area of base $= \pi \times 3^2 = 9\pi = 28.3$ cm^2 (1 dp)	Use formula for curved surface area Attempt to solve equation for r Use formula for area of base with your 'r' Correct answer	1 1 1 1
21.15	Volume of hemisphere $= \frac{2}{3}\pi r^3 = \frac{2}{3}\pi \times 12^3 = 1152\pi$ Volume of cylinder $= \pi r^2 h = \pi \times 12^2 \times 6 = 864\pi$ Total volume $= 1152\pi + 864\pi = 2016\pi$	Attempt to use $\frac{2}{3}\pi r^3$ with $r = 12$ Attempt to use $\pi r^2 h$ with $r = 12$ Add the two together Correct answer, in terms of π	1 1 1 1

Question	Answer	Extra information	Marks
21.16	$2x-3y=18 \quad (1)$ $3x+4y=-7 \quad (2)$ Multiply (1) by 4 and (2) by 3, then add the equations: $8x-12y=72$ $9x+12y=-21$ $17x=51$ $x=3$ Substitute $x=3$ into either (1) or (2) to get $y=-4$	Attempt to eliminate either x or y Correct equation in either x or y Solve to give $x=3$ or $y=4$ Correct answer	1 1 1 1
21.17 (a)	$x^2+6x+9=(x+3)(x+3)$		1
21.17 (b)	Side length $=(x+3)$		1
21.17 (c)	Perimeter $=4(x+3)=4x+12$		1