



4.14F Cylinders: Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 50 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** A cylinder has a diameter of 14 cm. Work out the radius of the cylinder.

(Total for Question 1 is 1 mark)

- 2** Work out the volume of a cylinder with radius 3 cm and height 5 cm. Give your answer in terms of π .

(Total for Question 2 is 2 marks)

- 3** A cylinder has radius 4 cm and height 10 cm. Work out the curved surface area of the cylinder. Give your answer in terms of π .

(Total for Question 3 is 2 marks)

- 4** Work out the total surface area of a cylinder with radius 2.5 cm and height 8 cm. Give your answer in terms of π .

(Total for Question 4 is 3 marks)

- 5 A metal storage can is a cylinder with radius 6 cm and height 12 cm. Find the volume of the can in litres. Give your answer correct to 3 significant figures.

(Total for Question 5 is 3 marks)

- 6 A water tank is a cylinder with diameter 1.2 m and height 2 m. Work out the curved surface area of the tank in square metres. Give your answer correct to 3 significant figures.

(Total for Question 6 is 2 marks)

- 7 A cylinder has height 10 cm and volume 1256 cm^3 . Work out the radius of the cylinder. Give your answer to 1 decimal place.

(Total for Question 7 is 3 marks)

- 8 Small scented candles are cylinders with radius 2 cm and height 8 cm. A shop has a box with internal volume 5.0 litres. What is the maximum number of these candles that can fit in the box if only volume is considered? You may give an answer as a whole number.

(Total for Question 8 is 3 marks)

- 9 A cylinder has diameter 10 cm. The total surface area of the cylinder is 314 cm^2 . Work out the height of the cylinder.

(Total for Question 9 is 3 marks)

- 10** A hollow tube has outer radius 5 cm, inner radius 3 cm and height 10 cm. Work out the total curved surface area (sum of the inner and outer curved surfaces) of the tube. Give your answer in terms of π .

(Total for Question 10 is 3 marks)

Mark scheme · 4.14F Cylinders: Foundation Tier Practice

Question 1

- **B1** 7 cm cao
- **Answer: 7 cm**

Question 2

- **M1** use $V = \pi * r^2 * h$ and substitute $r = 3$, $h = 5$
- **A1** $45\pi \text{ cm}^3$ cao
- **Answer: $45\pi \text{ cm}^3$**

Question 3

- **M1** use curved surface area $= 2 * \pi * r * h$ and substitute $r = 4$, $h = 10$
- **A1** $80\pi \text{ cm}^2$ cao
- **Answer: $80\pi \text{ cm}^2$**

Question 4

- **M1** use total surface area $= 2 * \pi * r * (r + h)$
- **M1** substitute $r = 2.5$, $h = 8$ to get $2 * \pi * 2.5 * 10.5 = 52.5\pi$
- **A1** $52.5\pi \text{ cm}^2$ cao
- **Answer: $52.5\pi \text{ cm}^2$**

Question 5

- **M1** calculate volume in cm^3 : $V = \pi * 6^2 * 12 = 432\pi \text{ cm}^3$
- **M1** convert to litres by dividing by 1000: $432\pi / 1000$
- **A1** 1.36 litres awrt ($432\pi/1000 = 1.357...$ so 1.36 to 3 s.f.)
- **Answer: 1.36 litres**

Question 6

- **M1** use curved surface area $= 2 * \pi * r * h$ with $r = 0.6$, $h = 2$ so $\text{CSA} = 2 * \pi * 0.6 * 2 = 2.4\pi$
- **A1** 7.54 m^2 awrt ($2.4\pi = 7.5398...$ so 7.54 to 3 s.f.)
- **Answer: 7.54 m^2**

Question 7

- **M1** use $V = \pi * r^2 * h$ so $r^2 = V / (\pi * h)$ and substitute $V = 1256$, $h = 10$
- **M1** calculate $r^2 = 1256 / (\pi * 10) = 125.6 / \pi = 40$ (correct substitution gives 40)
- **A1** 6.3 cm awrt ($r = \sqrt{40} = 6.3249...$ so 6.3 to 1 d.p.)
- **Answer: 6.3 cm**

Question 8

- **M1** calculate volume of one candle: $V = \pi * 2^2 * 8 = 32\pi \text{ cm}^3$
- **M1** convert box volume to cm^3 : 5.0 litres = 5000 cm^3 and divide: $5000 / (32\pi) = 49.75...$
- **A1** 49 candles (whole number, floor of 49.75...)
- **Answer: 49**

Question 9

- **M1** use $\text{TSA} = 2 * \pi * r * (r + h)$ with $r = 5$, so $314 = 2 * \pi * 5 * (5 + h) \Rightarrow 314 = 10\pi(5 + h)$
- **M1** solve $5 + h = 314 / (10\pi) = 31.4 / \pi = 10$ (using $\pi = 3.14$ or exact manipulation)
- **A1** 5 cm cao ($h = 10 - 5$)
- **Answer: 5 cm**

Question 10

- **M1** use curved surface areas: $2\pi * R * h + 2\pi * r * h = 2\pi * (R + r) * h$
- **M1** substitute $R = 5, r = 3, h = 10$ to get $2\pi * (5 + 3) * 10 = 160\pi$
- **A1** $160\pi \text{ cm}^2$ cao
- **Answer: $160\pi \text{ cm}^2$**