Surface area and volume: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Use the π key on your calculator unless a question says otherwise. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

Find the volume of a rectangular prism that is 8 cm long, 5 cm wide and 3 cm high.

Question 2

Find the total surface area of the rectangular prism in Question 1.

Question 3

A triangular prism has a cross-section that is a triangle with a base of 6 cm and a perpendicular height of 4 cm. The prism is 10 cm long. Find its volume.

Question 4

Convert:

(a) 3500 cm^3 to litres

(b) 2.4 m^3 to litres

Section B: Standard (Questions 5-10)

Question 5

Find the volume of a cylinder with radius 5 cm and height 12 cm. Give your answer correct to two decimal places.

Question 6

Find the total surface area of a closed cylinder with radius 3 cm and height 10 cm. Give your answer correct to two decimal places.

Question 7

A cylindrical rainwater tank has a diameter of 2 m and a height of 1.5 m.

(a) Find its volume in cubic metres, correct to two decimal places.

(b) How many litres does it hold when full, to the nearest litre? (1 m^3 = 1000 L)

Question 8

A triangular prism is 15 cm long. Its cross-section is a right-angled triangle with shorter sides of 6 cm and 8 cm.

(a) Show that the third side of the triangle is 10 cm.

(b) Find the volume of the prism.

(c) Find the total surface area of the prism.

Question 9

A prism is 20 cm long. Its cross-section is a trapezium with parallel sides of 4 cm and 10 cm, and a perpendicular height of 5 cm. Find the volume of the prism.

Question 10

A rectangular prism has a volume of 360 cm^3. Its base is 9 cm by 5 cm. Find its height.

Surface area and volume: answers

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Question 1

Answer: 120 cm^3

Question 2

Answer: 158 cm^2 (2(40 + 24 + 15))

Question 3

Answer: 120 cm^3 (½ × 6 × 4 × 10)

Question 4

Answer: (a) 3.5 L (b) 2400 L

Question 5

Answer: 942.48 cm^3 ($\pi \times 5^2 \times 12 = 300\pi$)

Question 6

Answer: 245.04 cm^2 ($2\pi \times 3^2 + 2\pi \times 3 \times 10 = 78\pi$)

Question 7

Answer: (a) 4.71 m^3 ($\pi \times 1^2 \times 1.5$) (b) 4712 L (also accept 4710 L if the rounded 4.71 m^3 from (a) was used)

Question 8

Answer: (a) $\sqrt{(6^2 + 8^2)} = \sqrt{(100)} = 10$ (b) 360 cm^3 (24 × 15) (c) 408 cm^2 (2 × 24 + 15 × (6 + 8 + 10))

Question 9

Answer: 700 cm^3 (cross-section (4 + 10)/(2) × 5 = 35 cm^2)

Question 10

Answer: 8 cm (360 ÷ 45)