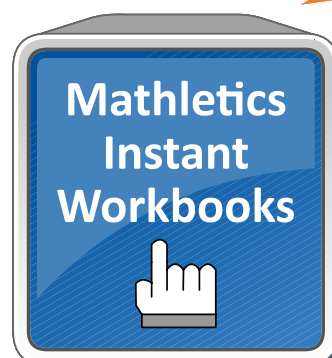
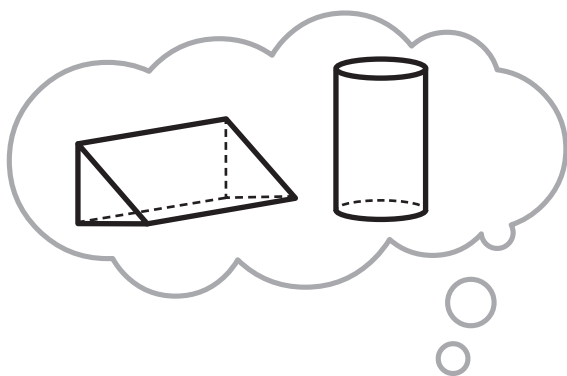


MATHLETICS

Surface Area and Volume

Teacher Book - Series J-1




Surface area and volume

Topic Test

PART A

Time allowed: 15 minutes

Total marks = 15

	Marks
1 The diameter and radius of a circle are related as (A) $rd = 2$ (B) $r = 2d$ (C) $d = 2r$ (D) $\frac{r}{d} = 2$	1
2 The circumference of a circle is given by the formula (A) $C = \frac{2\pi}{r}$ (B) $C = 2\pi r$ (C) $C = 2\pi d$ (D) $C = \frac{2\pi}{d}$	1
3 The area of a circle is given by the formula (A) $A = \frac{\pi}{r^2}$ (B) $A = \frac{\pi}{d^2}$ (C) $A = \pi r^2$ (D) $A = \pi d^2$	1
4 The volume of a cylinder with radius r and height h equals (A) $V = \pi^2 rh$ (B) $V = \pi rh^2$ (C) $V = \frac{1}{3}\pi r^2 h$ (D) $V = 2\pi rh$	1
5 A semi-circle equals (A) a full circle (B) half a circle (C) a quarter of a circle (D) a third of a circle	1
6 A quadrant is (A) $\frac{3}{4}$ of a circle (B) $\frac{1}{2}$ of a circle (C) $\frac{1}{3}$ of a circle (D) $\frac{1}{4}$ of a circle	1
7 The shaded area in the figure is called a  (A) semi-circle (B) segment (C) chord (D) sector	1
8 How many square centimetres are there in one square metre? (A) 100 (B) 1000 (C) 10 000 (D) 100 000	1
9 A rectangular prism is 10 cm long, 8 cm wide and 4 cm high. Its surface area is (A) 152 cm ² (B) 304 cm ² (C) 320 cm ² (D) 640 cm ²	1
10 Give the total surface area in cm ² correct to one decimal place of a closed cylinder with dimensions of radius 6 cm and height 15 cm. (A) 226.2 cm ² (B) 565.5 cm ² (C) 791.7 cm ² (D) 678.6 cm ²	1
11 A cube has a volume of 729 cm ³ . Find the length of each side of the cube. (A) 6 cm (B) 9 cm (C) 18 cm (D) 27 cm	1
12 A cylinder has height 9 m and radius 6 m. Its volume is closest to (A) 113 m ³ (B) 452 m ³ (C) 2036 m ³ (D) 1018 m ³	1
13 The volume of a rectangular pyramid with base area of 75 cm ² and vertical height of 8 cm is (A) 200 cm ³ (B) 400 cm ³ (C) 600 cm ³ (D) 800 cm ³	1
14 The volume of a cone with diameter 12 cm and height 8.5 cm is closest to (A) 320 cm ³ (B) 961 cm ³ (C) 1282 cm ³ (D) 3845 cm ³	1
15 The volume of a sphere of diameter 24 cm is closest to (A) 1810 cm ³ (B) 7238 cm ³ (C) 14 476 cm ³ (D) 57 906 cm ³	1

Total marks achieved for PART A

15

Surface area and volume

Topic Test

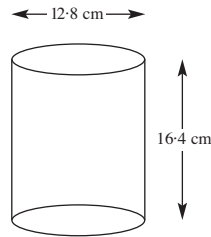
PART B

Time allowed: 15 minutes

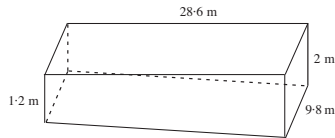
Total marks = 15

Question 1 For this closed cylinder, find the following correct to two decimal places.

- the area of a circular base
- the area of both the circular bases
- the area of its curved surface
- the total surface area
- the volume of this closed cylinder



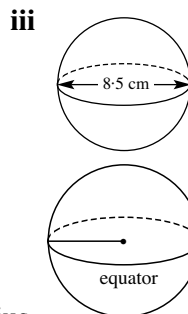
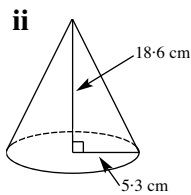
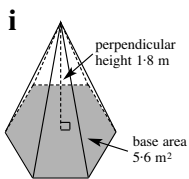
Question 2 A swimming pool has the shape of a trapezoidal prism as shown.



- Find the volume of the pool in m^3 .
- What is the capacity of the pool in kilolitres?
- The mass of 1 kL of water is 1 t. How many tonnes of water are in the pool?
- Tom treats this pool with a chlorine product to prevent the growth of algae. The recommended dose is 4 g of chlorine for each 100 L of water. How much chlorine must Tom place in the pool?
- Over a period of hot weather, the level of the pool dropped by 50 cm. The pool was originally full. What volume of water, in litres, evaporated?

Question 3

- Find the volume of each of the following correct to two decimal places.



- The circumference of the earth at the equator is about 40 000 km.

- Use the formula $C = 2\pi r$ to find the radius of the earth correct to the nearest 100 km.
- Use this radius to find the volume of the earth correct to two significant figures. Write your answer in scientific notation.

Marks

1

1

1

1

1

1

1

1

1

1

1

1

1

1

1

Total marks achieved for PART B

15

Answers – Surface area and volume

Page 1 1 a 384 m^2 b 541.5 m^2 2 a 788 cm^2 b 1861.56 cm^2 3 a 896 cm^2 b 1432 cm^2 4 a 1249.12 cm^2 b $10\,292.5 \text{ m}^2$

Page 2 1 a i 201.06 cm^2 ii 1005.31 cm^2 b i 176.71 cm^2 ii 1696.46 cm^2 2 a $70.68\pi \text{ cm}^2$ b $448\pi \text{ cm}^2$ 3 a i 145 cm^2 ii 287 cm^2 iii 431 cm^2 b i 56.5 cm^2 ii 204 cm^2 iii 260 cm^2 4 94.2 m^2

Page 3 1 a 216 m^3 b 438.976 m^3 2 a 1440 cm^3 b 834.768 cm^3 3 a 1536 cm^3 b 240 m^3 4 a 1794 m^3 b 7680 m^3

Page 4 1 a 2300 cm^3 b 5200 cm^3 c $41\,000 \text{ cm}^3$ d 1000 m^3 2 a 611.58 cm^3 b 688.03 cm^3 3 325.2 cm^3
4 a $21\,205.75 \text{ cm}^3$ b $42\,411.50 \text{ cm}^3$ \therefore cylinder B has larger volume 5 1.77 m^3

Page 5 1 a 501.4 cm^3 b 112.0 cm^3 2 a 3.57 m^3 b 520.70 cm^3 3 a 1.9 m^3 b 326.5 cm^3 4 a 1230 cm^3

Page 6 1 a 223.3 cm^3 b 1766.9 cm^3 2 a 49.18 m^3 b 96.96 cm^3 3 a 3015.93 cm^3 b 84.53 cm^3 c 1005.31 cm^3
4 $11\,309.73 \text{ cm}^3$

Page 7 1 a 1436.8 cm^3 b 3053.6 cm^3 c $65\,449.8 \text{ mm}^3$ d $11\,494.0 \text{ m}^3$ e $130\,924.3 \text{ cm}^3$ f 7986.4 km^3 2 a $17\,157.3 \text{ cm}^3$ b $102\,160.4 \text{ cm}^3$ 3 a $28\,952.9 \text{ cm}^3$ b $36\,811.1 \text{ cm}^3$ 4 a $26\,900.4 \text{ cm}^3$ b $20\,357.5 \text{ cm}^3$

Page 8 1 a 1 mL b 1 L c 1000 L 2 15 L 3 a $514\,718\,540.4 \text{ km}^2$ b $1.098 \times 10^{12} \text{ km}^3$ 4 a 6.72 m^3 b 6720 L c 104.2 mm
5 a $\$23\,998.40$ b $672\,000 \text{ L}$

Page 9 1 C 2 B 3 C 4 A 5 B 6 D 7 D 8 C 9 B 10 C 11 B 12 D 13 A 14 A 15 B

Page 10 1 a 128.68 cm^2 b 257.36 cm^2 c 659.48 cm^2 d 916.84 cm^2 e 2110.35 cm^3 2 a 448.448 m^3 b 448.448 kL c 448.448 tonnes d 17.94 kg e $140\,140 \text{ L}$ 3 a i 3.36 m^3 ii 547.13 cm^3 iii 321.56 cm^3 b i 6400 km ii $1.1 \times 10^{12} \text{ km}^3$