

Maharashtra Board Solutions Class 8-Maths (Practice Set 16.2): Chapter 16- Surface Area and Volume



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Maharashtra Board Solutions Class 8-Maths (Practice Set 16.2): Chapter 16- Surface Area and Volume

Class 8: Maths Chapter 16 solutions. Complete Class 8 Maths Chapter 16 Notes.

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Maharashtra Board 8th Maths Chapter 16, Class 8 Maths Chapter 16 solutions

Question 1.

In each example given below, radius of base of a cylinder and its height are given. Then find the curved surface area and total surface area.

i. $r = 7$ cm, $h = 10$ cm

ii. $r = 1.4$ cm, $h = 2.1$ cm

iii. $r = 2.5$ cm, $h = 7$ cm

iv. $r = 70$ cm, $h = 1.4$ cm

v. $r = 4.2$ cm, $h = 14$ cm

Solution:

i. Given: $r = 7$ cm and $h = 10$ cm

To find: Curved surface area of cylinder and total surface area

Curved surface area of the cylinder $= 2\pi rh$

$$= 2 \times 227 \times 7 \times 10$$

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$$= 2 \times 22 \times 10$$

$$= 440 \text{ sq.cm}$$

Total surface area of the cylinder:

$$= 2\pi r(h + r)$$

$$= 2 \times 22 \times 7(10 + 7)$$

$$= 2 \times 22 \times 7 \times 17$$

$$= 2 \times 22 \times 17$$

$$= 748 \text{ sq.cm}$$

The curved surface area of the cylinder is 440 sq.cm and its total surface area is 748 sq.cm.

ii. Given: $r = 1.4 \text{ cm}$ and $h = 2.1 \text{ cm}$

To find: Curved surface area of cylinder and total surface area

Curved surface area of the cylinder $= 2\pi rh$

$$= 2 \times 22 \times 1.4 \times 2.1$$

$$= 2 \times 22 \times 0.2 \times 2.1$$

$$= 18.48 \text{ sq.cm}$$

Total surface area of the cylinder $= 2\pi r(h + r)$

$$= 2 \times 22 \times 1.4 (2.1 + 1.4)$$

$$= 2 \times 22 \times 1.4 \times 3.5$$

$$= 2 \times 22 \times 0.2 \times 3.5$$

$$= 30.80 \text{ sq.cm}$$

$\therefore$ The curved surface area of the cylinder is 18.48 sq.cm and its total surface area is 30.80 sq.cm.

iii. Given: $r = 2.5 \text{ cm}$ and $h = 7 \text{ cm}$

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To find: Curved surface area of cylinder and total surface area

Curved surface area of the cylinder = $2\pi rh$

$$= 2 \times 227 \times 2.5 \times 7$$

$$= 2 \times 22 \times 2.5$$

$$= 110 \text{ sq.cm}$$

Total surface area of the cylinder = $2\pi r(h + r)$

$$= 2 \times 227 \times 2.5 (7 + 2.5)$$

$$= 2 \times 227 \times 2.5 \times 9.5$$

$$= 10457$$

$$= 149.29 \text{ sq.cm}$$

$\therefore$ The curved surface area of the cylinder is 110 sq.cm and its total surface area is 149.29 sq.cm.

iv. Given: $r = 70 \text{ cm}$ and $h = 1.4 \text{ cm}$

To find: Curved surface area of cylinder and total surface area

Curved surface area of the cylinder = $2\pi rh$

$$= 2 \times 227 \times 70 \times 1.4$$

$$= 2 \times 22 \times 10 \times 1.4$$

$$= 616 \text{ sq.cm}$$

Total surface area of the cylinder = $2\pi r(h + r)$

$$= 2 \times 227 \times 70 (1.4 + 70)$$

$$= 2 \times 227 \times 70 \times 71.4$$

$$= 2 \times 22 \times 10 \times 71.4$$

$$= 2 \times 22 \times 714$$

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$$= 31416 \text{ sq.cm}$$

∴ The curved surface area of the cylinder is 616 sq.cm and its total surface area is 31416 sq.cm.

v. Given: $r = 4.2 \text{ cm}$ and $h = 14 \text{ cm}$

To find: Curved surface area of cylinder and total surface area

Curved surface area of the cylinder $= 2\pi rh$

$$= 2 \times 227 \times 4.2 \times 14 = 2 \times 22 \times 4.2 \times 2$$

$$= 369.60 \text{ sq.cm}$$

Total surface area of the cylinder $= 2\pi r (h + r)$

$$= 2 \times 227 \times 4.2 (14 + 4.2)$$

$$= 2 \times 227 \times 4.2 \times 18.2$$

$$= 2 \times 22 \times 0.6 \times 18.2$$

$$= 480.48 \text{ sq.cm}$$

∴ The curved surface area of the cylinder is 369.60 sq.cm and its total surface area is 480.48 sq.cm.

Question 2.

Find the total surface area of a closed cylindrical drum if its diameter is 50 cm and height is 45 cm. ($\pi = 3.14$)

Given: For cylindrical drum:

Diameter (d) = 50 cm

and height (h) = 45 cm

To find: Total surface area of the cylindrical drum

Solution:

Diameter (d) = 50 cm

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$$\therefore \text{radius } (r) = d/2 = 50/2 = 25 \text{ cm}$$

$$\text{Total surface area of the cylindrical drum} = 2\pi r (h + r)$$

$$= 2 \times 3.14 \times 25 (45 + 25)$$

$$= 2 \times 3.14 \times 25 \times 70$$

$$= 10,990 \text{ sq.cm}$$

$\therefore$ The total surface area of the cylindrical drum is 10,990 sq.cm.

Question 3.

Find the area of base and radius of a cylinder if its curved surface area is 660 sq.cm and height is 21 cm.

Given: Curved surface area = 660 sq.cm, and height = 21 cm

To find: area of base and radius of a cylinder

Solution:

i. Curved surface area of cylinder = $2\pi rh$

$$\therefore 660 = 2 \times 22 \times r \times 21$$

$$\therefore 660 = 2 \times 22 \times r \times 3$$

$$\therefore 660 \div 2 \div 22 \div 3 = r$$

$$\therefore 660 \div 66 = r$$

$$\therefore 10 = r$$

i.e., $r = 10 \text{ cm}$

ii. Area of a base of the cylinder = πr^2

$$= 22 \times 10 \times 10$$

$$= 2200$$

$$= 2200 \text{ sq.cm}$$

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∴ The radius of the cylinder is 5 cm and the area of its base is 78.57 sq.cm.

Question 4.

Find the area of the sheet required to make a cylindrical container which is open at one side and whose diameter is 28 cm and height is 20 cm. Find the approximate area of the sheet required to make a lid of height 2 cm for this container.

Given: For cylindrical container:

diameter (d) = 28 cm, height (h_1) = 20 cm

For cylindrical lid: height (h_2) = 2 cm

To find: i. Surface area of the cylinder with one side open

ii. Area of sheet required to make a lid

Solution:

diameter (d) = 28 cm

∴ radius (r) = $\frac{d}{2} = \frac{28}{2} = 14$ cm

i. Surface area of the cylinder with one side open = Curved surface area + Area of a base

$$= 2\pi rh_1 + \pi r^2$$

$$= \pi r (2h_1 + r)$$

$$= 22 \times 14 \times (2 \times 20 + 14)$$

$$= 22 \times 2 \times (40 + 14)$$

$$= 22 \times 2 \times 54$$

$$= 2376 \text{ sq.cm}$$

ii. Area of sheet required to make a lid = Curved surface area of lid + Area of upper surface

$$= 2\pi rh_2 + \pi r^2$$

$$= \pi r (2h_2 + r)$$

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$$= 227 \times 14 \times (2 \times 2 + 14)$$

$$= 22 \times 2 \times (4 + 14)$$

$$= 22 \times 2 \times 18$$

$$= 792 \text{ sq cm}$$

∴ The area of the sheet required to make the cylindrical container is 2376 sq. cm and the approximate area of a sheet required to make the lid is 792 sq. cm.



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- Chapter 1- Rational and Irrational Numbers (Practice Set 1.1)
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- Chapter 1- Rational and Irrational Numbers (Practice Set 1.4)
- Chapter 2- Parallel Lines and Transversals (Practice Set 2.1)
- Chapter 2- Parallel Lines and Transversals (Practice Set 2.2)
- Chapter 2- Parallel Lines and Transversals (Practice Set 2.3)
- Chapter 3- Indices and Cube Root (Practice Set 3.1)
- Chapter 3- Indices and Cube Root (Practice Set 3.2)
- Chapter 3- Indices and Cube Root (Practice Set 3.3)
- Chapter 4- Altitudes and Medians of a Triangle (Practice Set 4.1)
- Chapter 5- Expansion Formulae (Practice Set 5.1)
- Chapter 5- Expansion Formulae (Practice Set 5.2)
- Chapter 5- Expansion Formulae (Practice Set 5.3)
- Chapter 5- Expansion Formulae (Practice Set 5.4)
- Chapter 6- Factorisation of Algebraic Expressions (Practice Set 6.1)
- Chapter 6- Factorisation of Algebraic Expressions (Practice Set 6.2)
- Chapter 6- Factorisation of Algebraic Expressions (Practice Set 6.3)
- Chapter 6- Factorisation of Algebraic Expressions (Practice Set 6.4)
- Chapter 7- Variation (Practice Set 7.1)

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- Chapter 7- Variation (Practice Set 7.2)
- Chapter 7- Variation (Practice Set 7.3)
- Chapter 8- Quadrilateral: Constructions and Types (Practice Set 8.1)
- Chapter 8- Quadrilateral: Constructions and Types (Practice Set 8.2)
- Chapter 8- Quadrilateral: Constructions and Types (Practice Set 8.3)
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- Chapter 9- Discount and Commission (Practice Set 9.2)
- Chapter 10- Division of Polynomials (Practice Set 10.1)
- Chapter 10- Discount and Commission (Practice Set 10.2)
- Chapter 11- Statistics (Practice Set 11.1)
- Chapter 11- Statistics (Practice Set 11.2)
- Chapter 11- Statistics (Practice Set 11.3)
- Chapter 12- Equations in One Variable (Practice Set 12.1)
- Chapter 12- Equations in One Variable (Practice Set 12.2)
- Chapter 13- Congruence of Triangles (Practice Set 13.1)
- Chapter 13- Congruence of Triangles (Practice Set 13.2)
- Chapter 14- Compound Interest (Practice Set 14.1)
- Chapter 14- Compound Interest (Practice Set 14.2)
- Chapter 15- Area (Practice Set 15.1)
- Chapter 15- Area (Practice Set 15.2)
- Chapter 15- Area (Practice Set 15.3)
- Chapter 15- Area (Practice Set 15.4)
- Chapter 15- Area (Practice Set 15.5)
- Chapter 15- Area (Practice Set 15.6)
- Chapter 16- Surface Area and Volume (Practice Set 16.1)

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- Chapter 17- Factorisation of Algebraic Expressions (Practice Set 17.1)
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The Maharashtra State Board of Secondary and Higher Secondary Education or MSBSHSE (Marathi: महाराष्ट्र राज्य माध्यमिक आणि उच्च माध्यमिक शिक्षण मंडळ), is an **autonomous and statutory body established in 1965**. The board was amended in the year 1977 under the provisions of the Maharashtra Act No. 41 of 1965.

The Maharashtra State Board of Secondary & Higher Secondary Education (MSBSHSE), Pune is an independent body of the Maharashtra Government. There are more than 1.4 million students that appear in the examination every year. The Maha State Board conducts the board examination twice a year. This board conducts the examination for SSC and HSC.

The Maharashtra government established the Maharashtra State Bureau of Textbook Production and Curriculum Research, also commonly referred to as Ebalbharati, in 1967 to take up the responsibility of providing quality textbooks to students from all classes studying under the Maharashtra State Board. MSBHSE prepares and updates the curriculum to provide holistic development for students. It is designed to tackle the difficulty in understanding the concepts with simple language with simple illustrations. Every year around 10 lakh students are enrolled in schools that are affiliated with the Maharashtra State Board.

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As of now, the MSCERT and Balbharti are responsible for the syllabus and textbooks of Classes 1 to 8, while Classes 9 and 10 are under the Maharashtra State Board of Secondary and Higher Secondary Education (MSBSHSE).

How many state boards are there in Maharashtra?

The Maharashtra State Board of Secondary & Higher Secondary Education, conducts the HSC and SSC Examinations in the state of Maharashtra through its nine Divisional Boards located at Pune, Mumbai, Aurangabad, Nasik, Kolhapur, Amravati, Latur, Nagpur and Ratnagiri.

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