

ACTIVITY

Cylinder Experimental

Objective

To find the curved surface area and total surface area of a cylinder experimentally.

Pre-requisite Knowledge

1. Area of a rectangle.
2. Area of a circle.
3. Concept of surface area of a cylinder.

Materials Required

A white chart paper, a cylinder made of paper, a pair of scissors, a ruler, glue.

Procedure

1. Remove the top and bottom circles of the cylinder.
2. Make a vertical cut in the curved surface and lay the cylinder flat to get a rectangle as shown.
3. Measure the length and breadth of the rectangle so formed.

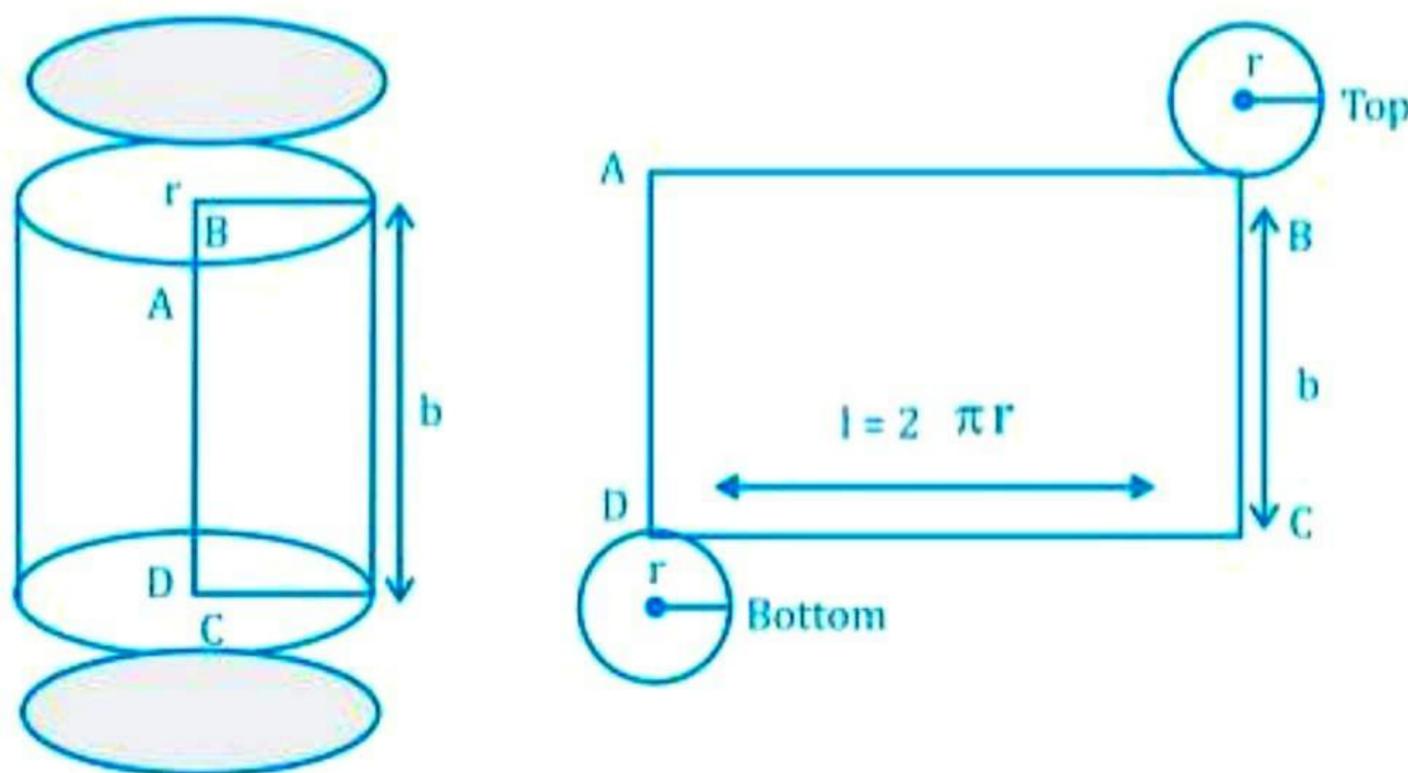


fig. (i)

Observation

1. Top and bottom of cylinders are circles. Therefore, Area of 2 circles = $2\pi r^2$, where r is the radius of base circle of cylinder
2. Length of rectangle = circumference of base of cylinder = $2\pi r$
3. Breadth of rectangle = height = h
4. Area of rectangle = $2\pi r \times h$ = curved surface area of cylinder
5. Total surface area of cylinder = $2\pi rh + 2\pi r^2 = 2\pi r(h + r)$

Result

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

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

Learning Outcome

This activity' clears the concept of curved surface area (lateral surface area) and total surface area of a cylinder.

Activity Time

Calculate the total surface area in terms of radius, where, 'd' represents the diameter of the cylinder.

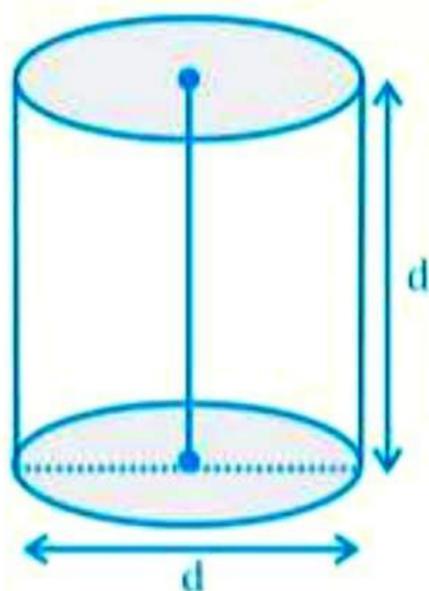


Fig. (ii)

Viva voice

Q1. What is curved surface area of a cylinder?

Ans: $2\pi rh$

Q2. What is total surface area of a cylinder?

Ans: $2\pi r(r + h)$

Q3. Write the number of circular faces of a cylinder?

Ans: 2

Q4. What is the area of a circular face of cylinder?

Ans: πr^2

Q5. If $h = 7$ cm and $r = 2$ cm, find the lateral surface area of a cylinder.

Ans: $2\pi rh = 2 \times \frac{22}{7} \times 2 \times 7 = 88 \text{ cm}^2$

Q6. What will be the curved surface area of a cylinder if its height is 3 times of its radius?

Ans: $6\pi r^2$

Q7. What will be the curved surface area of a cylinder if its height is equal to the diameter of the base?

Ans: $4\pi r^2$

Multiple Choice Questions

- Q 1.** The curved surface area of a right circular cylinder of height 14 cm is 88 cm^2 . The diameter of the base of the cylinder is:
- (a) 2 cm (b) 1 cm (c) 1.5 cm (d) None of these
- Q 2.** The curved surface area of a right circular cylinder is 4.4 m^2 . If the radius of the base of the cylinder is 0.7 m, find its height.
- (a) 2 m (b) 1.5 m (c) 1 m (d) None of these
- Q 3.** A cylindrical pillar is 5 m in diameter and 3.5 m in height. Find the cost of painting the curved surface of the pillar at the rate of Rs.12.50 per m^2 .
- (a) Rs. 69.75 (b) Rs. 68.75 (c) Rs.67.75 (d) None of these
- Q 4.** A rectangular sheet of paper $44 \text{ cm} \times 18 \text{ cm}$ is rolled along its length and a cylinder is formed. The radius of the cylinder is:
- (a) 7 cm (b) 9 cm (c) 22 cm (d) None of these
- Q 5.** The radius and height of a cylinder are in the ratio 5:7 and its curved surface area is 220 cm^2 . The radius and height are respectively.
- (a) 5 cm & 7 cm (b) 7 cm & 5 cm (c) 5 cm & 5 cm (d) 1 cm & 7 cm
- Q 6.** The curved surface area of a cylinder is 1000 cm^2 and its diameter is 20 cm. The height of the cylinder is:
- (a) 15.9 cm (b) 15.8 cm (c) 19.5 cm (d) None of these
- Q 7.** Find the curved surface area of a right circular cylinder of height 14 cm and base radius 1 cm.
- (a) 88 cm^2 (b) 80 cm^2 (c) 82 cm^2 (d) 84 cm^2
- Q 8.** What is the height of a cylinder of base radius as 1 cm and curved surface area as 88 cm^2 ?
- (a) 11 cm (b) 14 cm (c) 44 cm (d) None of these
- Q 9.** A metal pipe is 77 cm long. The inner diameter of a cross-section is 4 cm, the outer diameter being 4.4 cm. Its outer curved surface area is:
- (a) 1064.8 cm^2 (b) 1406.8 cm^2 (c) 1460.8 cm^2 (d) None of these
- Q 10.** What is the curved surface area of a right circular cylinder of base radius 0.7 m and height 1 m?
- (a) 4.4 m^2 (b) 4.1 m^2 (c) 1.1 m^2 (d) None of these

ANSWER KEY

1. (a) 2. (c) 3. (b) 4. (a) 5. (a) 6. (a) 7. (a) 8. (b) 9. (a) 10. (a)