

Ques: The Curved surface area of a right Circular Cylinder of height 14cm is 88 cm^2 . Find the diameter of the base of the cylinder.

Sol: Height of Cylinder = 14cm
Curved surface area = 88 cm^2

$$2\pi rh = 88\text{ cm}^2$$

$$2 \times \frac{22}{7} \times r \times 14 = 88\text{ cm}^2$$

$$2 \times \frac{22}{7} \times r \times 14 = 88\text{ cm}^2$$

$$4 \times 22 \times r = 88\text{ cm}^2$$

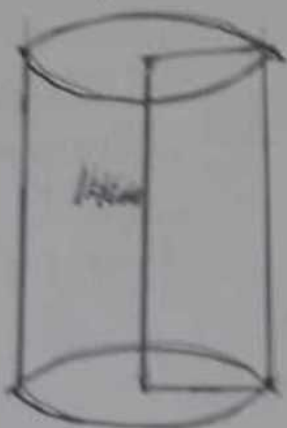
$$r = \frac{88}{4 \times 22}$$

$$r = 1\text{ cm}$$

$$\text{radius} = 1\text{ cm}$$

$$\text{Diameter} = 2 \times r$$

$$= 2 \times 1 = 2\text{ cm. Ans.}$$



11.
2 Sum: It is required to make a cylindrical tank of height 1m and base diameter 140cm from a metal sheet. How many square metres of the sheet are required for the same?

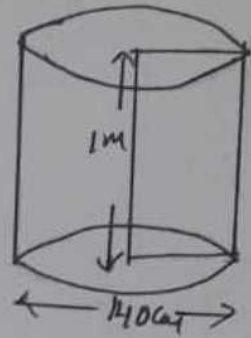
Sol:-

$$\text{Height} = 1\text{ m}$$

$$\text{Diameter} = 140\text{ cm}$$

$$\begin{aligned}\text{Radius} &= \frac{140}{2} \text{ cm} \\ &= \frac{140}{2 \times 100} \text{ m} \\ &= \frac{70}{100} \text{ m}\end{aligned}$$

$$\text{Radius} = \frac{7}{10} \text{ m}$$



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

$$= 2 \times \frac{22}{7} \times \frac{7}{10} \left(1 + \frac{7}{10} \right)$$

$$= \frac{44}{10} \times \left(\frac{10+7}{10} \right)$$

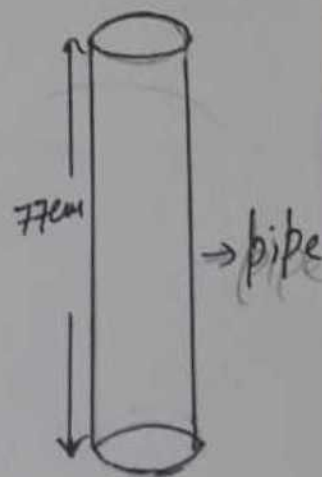
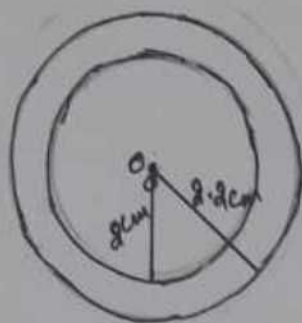
$$= \frac{44}{10} \times \frac{17}{10} = \frac{748}{100} \text{ m}^2$$

$$= \underline{7.48 \text{ m}^2} \text{ Ans}$$

cm. A metal pipe is 77cm long. The inner diameter of a cross section is 4cm, the outer diameter being 4.4cm. Find its.

- (i) inner curved surface area.
- (ii) outer curved surface area
- (iii) total surface area.

Sol:-



$$\text{Height} = 77\text{cm}$$

$$\text{Inner diameter} = 4\text{cm}$$

$$r = \frac{4}{2} = 2\text{cm}$$

$$\text{outer diameter} = 4.4\text{cm}$$

$$R = \frac{4.4}{2} = 2.2\text{cm}$$

$$\text{Inner Curved Surface area} = 2\pi rh$$

$$= 2 \times \frac{22}{7} \times 2 \times 77$$

$$= 2 \times 22 \times 2 \times 11$$

$$= 968\text{cm}^2$$

$$\text{outer Curved Surface area} = 2\pi Rh$$

$$= 2 \times \frac{22}{7} \times 2.2 \times 77$$

$$= 2 \times \frac{22}{7} \times 2.2 \times 11$$

$$= 1064.80\text{cm}^2$$

Total Surface area :- Inner Curved Surface area + outer Curved Surface area + 2x Area of ring

$$2 \times \text{Area of rings} = 2 \times \pi (R^2 - r^2)$$

$$= 2 \times \frac{22}{7} [(2.2)^2 - (2)^2]$$

$$= 2 \times \frac{22}{7} \times [4.84 - 4]$$

$$= 2 \times \frac{22}{7} \times 0.84 =$$

$$\frac{3 \text{ Sum}}{13.2}$$

$$= 2 \times \frac{22}{7} \times 0.84$$

$$= 2 \times \frac{22}{7} \times 0.12$$

$$= 5.28 \text{ cm}^2$$

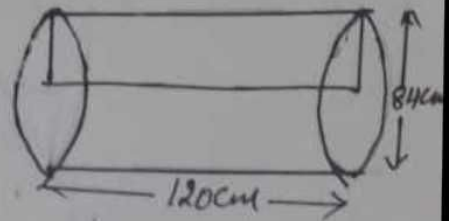
Total surface area = Inner Curved surface area
+ outer Curved surface area + 2x area of rings

$$= 968 \text{ cm}^2 + 1064.80 \text{ cm}^2 + 5.28 \text{ cm}^2$$

$$= \underline{2038.08 \text{ cm}^2} \text{ Ans}$$

14.
4. Sum: The diameter of a roller is 84cm and its length is 120cm. It takes 500 complete revolutions to move once over to level a playground. Find the area of the playground in m^2 .

Sol: ∴ Diameter of roller = 84cm
Radius of roller = $\frac{84}{2} = 42cm$
Length of roller = 120cm



Curved surface area of roller = $2\pi rh$

$$= 2 \times \frac{22}{7} \times 42 \times 120 \text{ cm}^2$$

$$= 2 \times \frac{22}{7} \times 42^6 \times 120 \text{ cm}^2$$

$$= 31680 \text{ cm}^2$$

$$\text{For 500 revolutions} = 31680 \times 500 \text{ cm}^2$$

$$= 15840000 \text{ cm}^2$$

$$= \frac{15840000}{100 \times 100} \text{ m}^2$$

$$= \underline{1584 \text{ m}^2} \text{ Ans.}$$

Ex. 13.2: A Cylindrical pillar is 50cm in diameter and 3.5m in height. Find the Cost of painting the Curve surface of the pillar at the rate of Rs 12.50 per m^2 .

Sol:

Diameter of pillar = 50cm

Radius of pillar = $\frac{50}{2}$ cm

$$= \frac{50}{2 \times \frac{100}{2}} m$$

$$= \frac{1}{4} m$$

Height of pillar = 3.5m

Curved surface area of pillar = $2\pi rh$

$$= 2 \times \frac{22}{7} \times \frac{1}{4} \times 3.5$$

$$= 2 \times \frac{22}{7} \times \frac{1}{4} \times \frac{35}{10} m^2$$

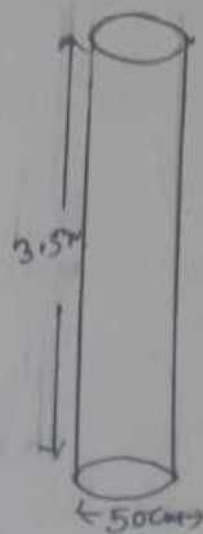
$$= 1 \times \frac{22}{7} \times \frac{1}{2} \times \frac{35}{10} m^2$$

$$= \frac{55}{10} m^2 = 5.5 m^2$$

Cost of painting the pillar of $1 m^2$ = Rs 12.50

Cost of painting the pillar of $5.5 m^2$ = Rs 12.50 $\times$ 5.5

= Rs 68.75 Ans



16.
Ex. 13.2 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.

Sol :

Radius of cylinder = 0.7 m

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

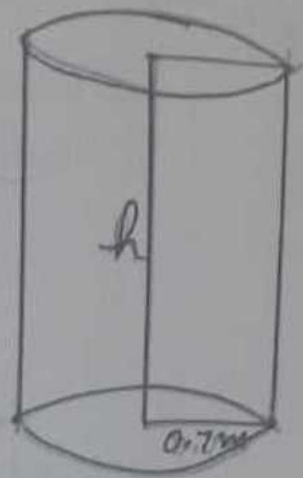
$$4.4 = 2 \times \frac{22}{7} \times 0.7 \times h$$

$$\frac{44}{10} = 2 \times \frac{22}{7} \times \frac{7}{10} \times h$$

$$\cancel{22} \frac{44}{10} \times \frac{1}{\cancel{2}} \times \frac{\cancel{7}}{\cancel{22}} \times \frac{10}{\cancel{\pi}} = h$$

$$1 \text{ m} = h$$

Height of cylinder = 1 m Ans.



7. Sum : The inner diameter of a circular well is 3.5 m. It is 10 m deep. Find
13.2
(i) its inner curved surface area
(ii) the cost of plastering this curved surface at the rate of Rs 40 per m^2 .

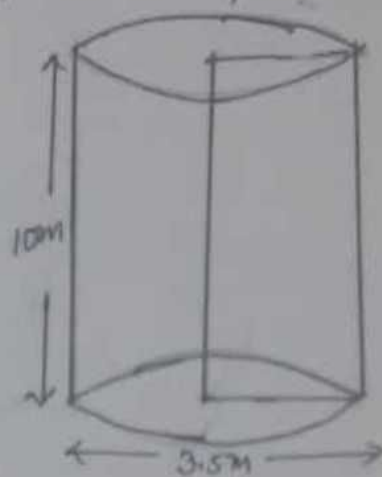
Sol :

Diameter of Cylinder = 3.5 m

Radius of Cylinder = $\frac{3.5}{2}$ m

$$= \frac{35}{10 \times 2} \text{ m}$$

Height of Cylinder = 10 m



Curved surface area = $2\pi rh$

$$= 2 \times \frac{22}{7} \times \frac{35}{10 \times 2} \times 10$$

$$= 110 \text{ m}^2$$

Cost of plastering of 1 m^2 = Rs 40

Cost of plastering of 110 m^2 = Rs 40×110

$$= \text{Rs } 4400. \text{ Ans}$$

8. Exm : In a hot water heating system, there is a cylindrical pipe of length 28 m and diameter 5 cm. Find the total radiating system in the system.

Sol : - Height = 28 m

Diameter = 5 cm

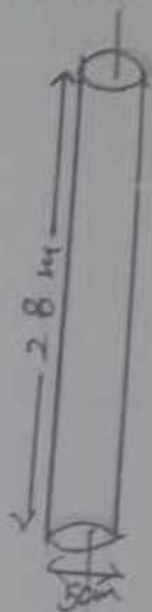
$$\text{Radius} = \frac{5}{2} \times \frac{1}{100} \text{ m}$$

Curved Surface Area = $2\pi rh$

$$= 2 \times \frac{22}{7} \times \frac{5}{2 \times 100} \times 28$$

$$= \frac{440}{100} \text{ m}^2$$

Total radiating surface = 4.4 m² Ans



19
 Q. Sum: Find (i) the Curved surface area of a closed cylindrical petrol storage tank that is 4.2 m in diameter and 4.5 m high.

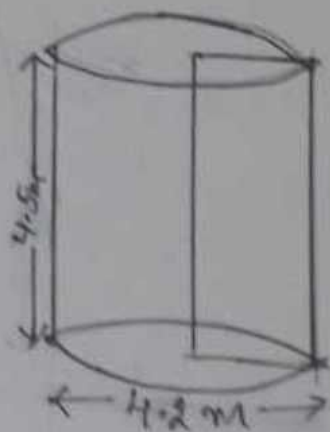
(ii) how much steel was actually used, if $\frac{1}{12}$ of the steel actually used was wasted in making the tank.

Sol:

$$\text{Diameter} = 4.2 \text{ m}$$

$$\text{radius} = \frac{4.2}{2} = 2.1 \text{ m}$$

$$\text{Height} = 4.5 \text{ m}$$



$$\begin{aligned} \text{Curved surface area} &= 2\pi rh \\ &= 2 \times \frac{22}{7} \times 2.1 \times 4.5 \\ &= 44 \times 0.3 \times 4.5 \\ &= 44 \times 1.35 = 59.4 \text{ m}^2 \text{ Ans} \end{aligned}$$

$$\begin{aligned} \text{(ii) Total surface area} &= 2\pi r(r+h) \\ &= 2 \times \frac{22}{7} \times 2.1 (2.1 + 4.5) \\ &= 44 \times 0.3 (6.6) \\ &= 87.12 \text{ m}^2 \end{aligned}$$

$$\text{Let total steel} = x$$

$$\text{waste steel} = \frac{x}{12}$$

$$\frac{x - \frac{x}{12}}{1} = 87.12$$

$$\frac{12x - x}{12} = 87.12$$

$$\frac{11x}{12} = 87.12$$

$$x = \frac{87.12 \times 12}{11} = 95.04 \text{ m}^2$$

$$\text{Total steel} = 95.04 \text{ m}^2 \text{ Ans}$$

10 Ques: In fig, You see the frame of a lampshade.²⁰
 It is to be covered with a decorative cloth.
 The frame has a base diameter of 20 cm and height of 30 cm. A margin of 2.5 cm is to be given for folding it over the top and bottom of the frame. Find how much cloth is required for covering the lampshade.

Sol:-

$$\text{diameter} = 20 \text{ cm}$$

$$\text{radius} = \frac{20}{2} \text{ cm}$$

$$\text{Height} = 30 \text{ cm}$$

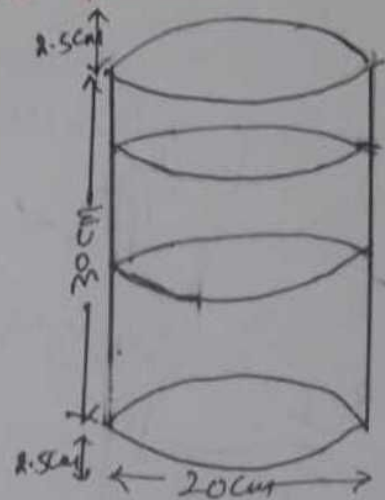
$$\text{margin} = 2.5 \text{ cm}$$

$$\text{Total Height} = 30 + 2.5 + 2.5 = 35$$

$$\text{Curved surface area} = 2\pi rh$$

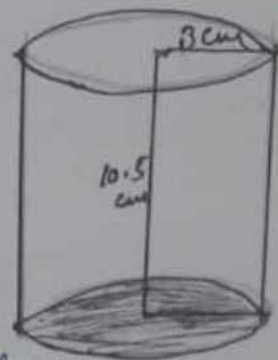
$$= 2 \times \frac{22}{7} \times 10 \times 35$$

$$= 44 \times 50 = 2200 \text{ cm}^2 \text{ Ans.}$$



Sum
3.2 The students of a vidyalaya were asked to participate in a Competition for making and decorating penholders in the shape of a Cylinder with a base, using Cardboard. Each penholder was to be of radius 3cm and height 10.5cm. The vidyalaya was to supply the Competitors with Cardboard. If there were 35 Competitors, how much Cardboard was required to be bought for the Competition?

Sol:- Radius = 3cm
Height = 10.5cm



Area of Cardboard = Curved Surface Area + area of bottom

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

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

$$= \frac{22}{7} \times 3 (2 \times 10.5 + 3)$$

$$= \frac{66}{7} (21.0 + 3)$$

$$= \frac{66}{7} \times 24$$

$$= \frac{1584}{7} \text{ m}^2$$

for 35 Competitors = $\frac{1584}{7} \times 35 \text{ cm}^2$

$$= \underline{7920 \text{ cm}^2} \text{ ans}$$