

Surface Area and volume of A Right Circular cylinder Ex 19.2 Q21 **Answer:**

Given data is as follows:

h = 14 cm

Outer Curved Surface Area - Inner Curved Surface Area = 88 cm2

Volume = 176 cm^3

We have to find the inner and outer radii of the tube.

As given in the problem we have,

$$2\pi Rh - 2\pi rh = 88$$

$$2\pi h(R-r) = 88$$

$$2 \times \frac{22}{7} \times 14(R-r) = 88$$

$$R-r=1$$

Also, from the given data we have,

$$\pi R^2 h - \pi r^2 h = 176$$

$$\pi h(R^2 - r^2) = 176$$

$$\frac{22}{7} \times 14 \times (R-r)(R+r) = 176$$

$$(R-r)(R+r)=4$$

We have already found out that R-r=1

Therefore,

R + r = 4

Now let us solve these two equations, by adding them

R-r=1

R + r = 4

We get

2R = 5

R = 2.5

Substituting for R in R-r=1, we get

r = 1.6

Thus, inner radius of the pipe is equal to 1.5 cm and outer radius of the pipe is equal to 2.5 cm.

Surface Area and volume of A Right Circular cylinder Ex 19.2 Q22

Answer:

Given data is as follows:

Internal diameter of the pipe = 2 cm

Water flow rate through the pipe = 6 m/sec

Radius of the tank = 60 cm

Time = 30 minutes

The volume of water that flows for 1 sec through the pipe at the rate of 6 m/sec is nothing but the volume of the cylinder with h = 6.

Also, given is the diameter which is 2 cm. Therefore,

r = 1 cm

Since the speed with which water flows through the pipe is in meters/second, let us convert the radius of the pipe from centimeters to meters. Therefore,

$$r = \frac{1}{100}$$
 n

Volume of water that flows for 1 sec =
$$\frac{22}{7} \times \frac{1}{100} \times \frac{1}{100} \times 6$$

Now, we have to find the volume of water that flows for 30 minutes.

Since speed of water is in meters/second, let us convert 30 minutes into seconds. It will be 30×60

Volume of water that flows for 30 minutes =
$$\frac{22}{7} \times \frac{1}{100} \times \frac{1}{100} \times 6 \times 30 \times 60$$

Now, considering the tank, we have been given the radius of tank in centimeters. Let us first convert it into meters. Let radius of tank be ${}^{\circ}R^{\circ}$.

$$R = 60 \text{ cm}$$

$$R = \frac{60}{100} \text{ m}$$

Volume of water collected in the tank after 30 minutes=
$$\frac{22}{7} \times \frac{60}{100} \times \frac{60}{100} \times h$$

We know that

Volume of water collected in the tank after 30 minutes= Volume of water that flows through the pipe for 30 minutes

$$\frac{22}{7} \times \frac{60}{100} \times \frac{60}{100} \times h = \frac{22}{7} \times \frac{1}{100} \times \frac{1}{100} \times 6 \times 30 \times 60$$

$$h = 3m$$

Therefore, the height of the tank is 3 meters.

