

12.2 Lateral Area and Surface Area of Prisms

$$LA = ph$$

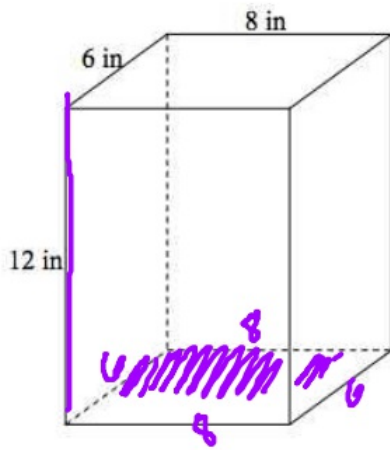
$$SA = LA + 2B$$

p : perimeter of the base

h : height of the prism

B : Area of the base

Example 1: Find the lateral area and surface area of the prism.



$$LA = ph$$

$$LA = (28)(12)$$

$$LA = 336 \text{ in}^2$$

$$SA = LA + 2B$$

$$SA = 336 + 2(48)$$

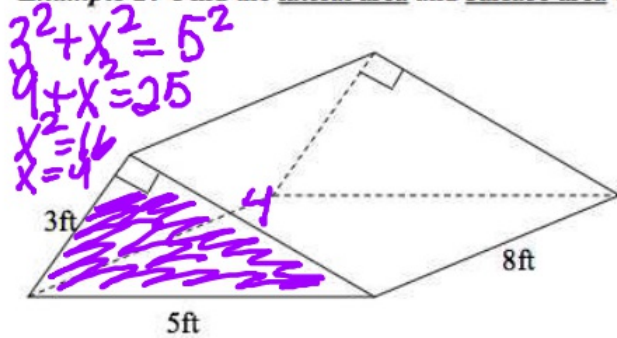
$$336 + 96$$

$$SA = 432 \text{ in}^2$$

$$LA = \frac{336 \text{ in}^2}{}$$

$$SA = \frac{432 \text{ in}^2}{}$$

Example 2: Find the lateral area and surface area of the prism.



$$LA = ph$$

$$LA = (12)(8)$$

$$LA = 96 \text{ in}^2$$

$$SA = LA + 2B$$

$$SA = 96 + 2\left(\frac{1}{2} \cdot 3 \cdot 4\right)$$

$$SA = 96 + 12$$

$$SA = 108 \text{ in}^2$$

$$LA = \frac{96 \text{ in}^2}{}$$

$$SA = \frac{108 \text{ in}^2}{}$$

12.2 Lateral Area and Surface Area of Cylinders

The lateral area of a cylinder is $LA = ph$ OR

$$LA = 2\pi rh$$

(How do you find the *perimeter* of a circle?)

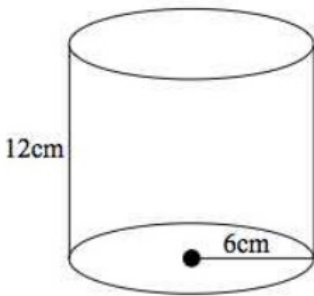
The surface area of a cylinder is $SA = LA + 2B$
 $LA + 2\pi r^2$

C: circumference

h: height

B: Area of the base

Example 3: Find the lateral area and surface area of the following cylinders. Leave answers in terms of π .



$$LA = ph$$

$$LA = 2\pi rh$$

$$LA = 2\pi(6)(12)$$

$$LA = 144\pi$$

$$S.A. = LA + 2B$$

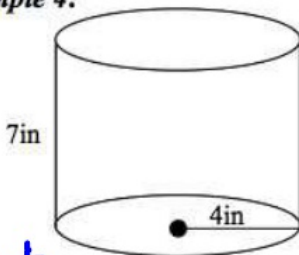
$$S.A. = 144\pi + 2\pi(6)^2$$

$$S.A. = \frac{144\pi + 72\pi}{216\pi}$$

$$LA = \underline{144\pi \text{ cm}^2}$$

$$SA = \underline{216\pi \text{ cm}^2}$$

Example 4:



$$LA = ph$$

$$LA = 2\pi(4)(7)$$

$$LA = 56\pi$$

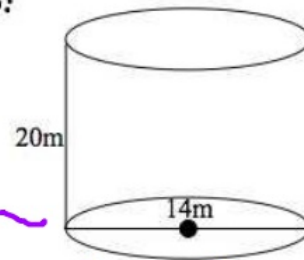
$$SA = 56\pi + 2\pi(4)^2$$

$$SA = 56\pi + 32\pi$$

$$LA = \underline{56\pi \text{ in}^2}$$

$$SA = \underline{88\pi \text{ in}^2}$$

Example 5:



$$LA = ph$$

$$LA = 2\pi rh$$

$$LA = 2\pi(14)(20)$$

$$LA = 280\pi \text{ m}^2$$

$$SA = LA + 2B$$

$$SA = 280\pi + 2\pi(14)^2$$

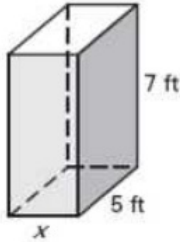
$$SA = 280\pi + 784\pi = 1064\pi$$

$$LA = \underline{280\pi \text{ m}^2}$$

$$SA = \underline{1064\pi \text{ m}^2}$$

Example 6: Solve for the indicated measure, x , given the surface area of the prism or cylinder. Round your answer to the nearest hundredth.

A. $S = 142 \text{ ft}^2$



$$SA = LA + 2B$$

$$SA = ph + 2B$$

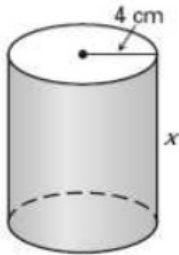
$$142 = 24(x) + 2(35)$$

$$142 = 24x + 70$$

$$72 = 24x$$

$$\boxed{3 = x}$$

B. $S = 326.73 \text{ cm}^2$



$$\star SA = LA + 2B$$

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

$$326.73 = 2\pi(4)(x) + 2\pi(4)^2$$

$$326.73 = 25.13x + 100.53$$

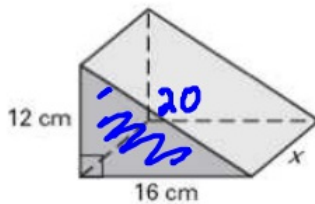
$$-100.53$$

$$-100.53$$

$$\frac{226.2}{25.13} = \frac{25.13x}{25.13}$$

$$\boxed{x \approx 9.00 \text{ cm}}$$

C. $S = 864 \text{ cm}^2$



$$SA = LA + 2B$$

$$SA = ph + 2B - \text{triangle}$$

$$864 = 48x + 2\left(\frac{1}{2} \cdot 12 \cdot 16\right)$$

$$864 = 48x + 192$$

$$\frac{672}{48} = \frac{48x}{48}$$

$$\boxed{x = 14 \text{ cm}}$$

$$12^2 + 16^2 = c^2$$

$$\sqrt{400} = \sqrt{c^2}$$

$$20 = c$$