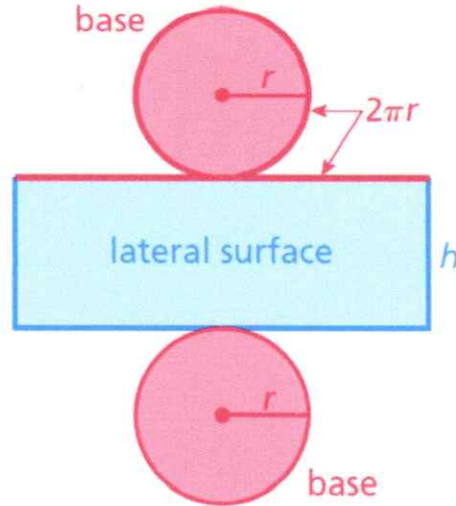
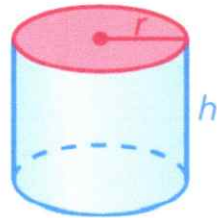


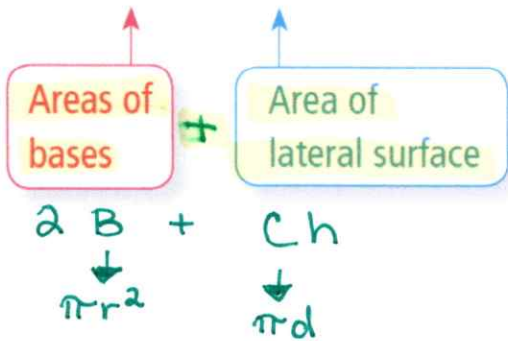
### 14.3 Surface Area of Cylinders p.602

A **cylinder** is a solid 3-dimensional figure that has two parallel identical circular bases. *Think of any can.*

**Words** The surface area  $S$  of a cylinder is the sum of the areas of the bases and the lateral surface.

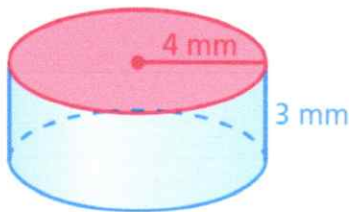


**Algebra**  $S = 2\pi r^2 + 2\pi rh$



2 bases of circles ( $\pi r^2$ ) + circumference (around the can which is also the length of a rectangle) times the height of the can (which is also the width of a rectangle)

1.



Bases + LSA

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

$$2(3.14)(4)^2 + 2(3.14)(4)(3)$$

$$100.48 + 75.36$$

$$\boxed{175.84 \text{ mm}^2}$$

Bases + LSA

$$\frac{2\pi r^2 + \pi dh}{2\pi r^2 + \pi dh}$$

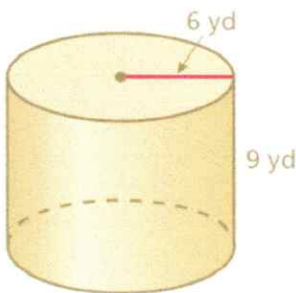
or  $2(3.14)(4)^2 + 3.14(8)(3)$

$$100.48 + 75.36$$

$$\boxed{175.84}$$

use the diameter

2.



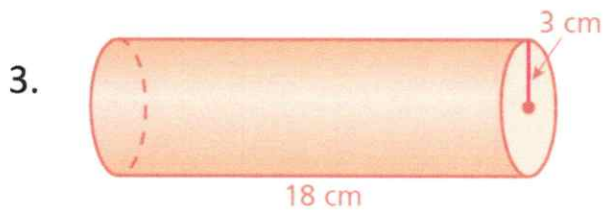
Bases + LSA

$$2\pi r^2 + \pi dh$$

$$2(3.14)6^2 + 3.14(12)(9)$$

$$226.08 + 339.12$$

$$\boxed{565.2 \text{ yd}^2}$$



$$\begin{aligned} & \text{Bases} + \text{LSA} \\ & 2 \cdot 3.14(3)^2 + 3.14(6)(18) \\ & 56.52 + 339.12 \\ & \boxed{395.64 \text{ cm}^2} \end{aligned}$$

\* recall that the height will always connect the bases

4. How much paper is needed for the label on the can of peas?  
Lateral Surface area only



$$\begin{aligned} & 3.14(5)(4) \\ & \boxed{62.8 \text{ in}^2} \end{aligned}$$

5. What if the can of peas is doubled? Does the amount of the paper used in the label double as well?  
If not doubled, by how many times more has the lateral surface area increased?

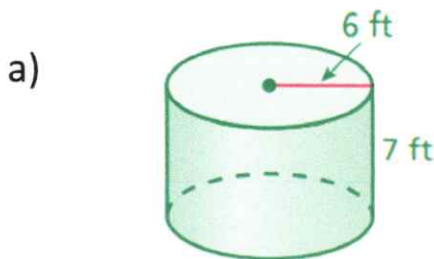
$$\begin{aligned} & \text{LSA} = 3.14(10)(8) \\ & \boxed{251.2 \text{ in}^2} \end{aligned}$$

$$\begin{aligned} & r = 5 \\ & h = 8 \end{aligned}$$

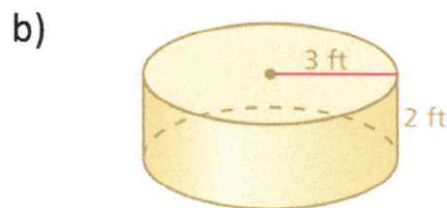
$$\frac{251.2}{62.8} = 4$$

no, not doubled ~ actually 4 times as big

Find the lateral surface area of each:



$$\begin{aligned} & 3.14(12)(7) \\ & \boxed{263.76 \text{ ft}^2} \end{aligned}$$



$$\begin{aligned} & 3.14(6)(2) \\ & \boxed{37.68 \text{ ft}^2} \end{aligned}$$

\* note that BIM rounds answers in this lesson to the tenths place