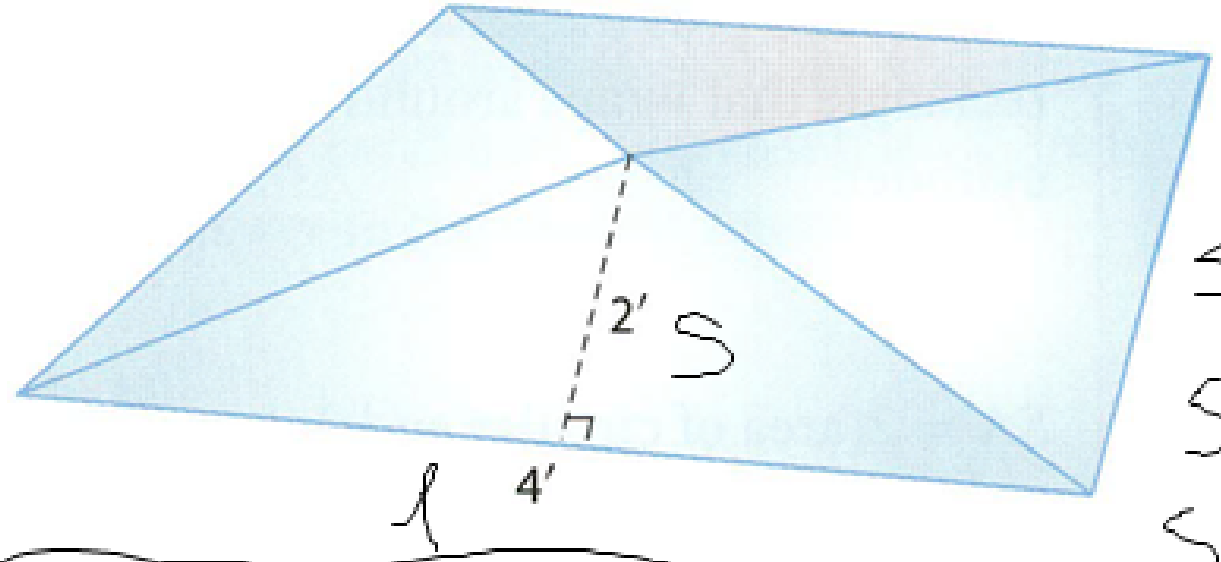
5. A company that installs windows and doors makes pyramid-shaped skylights for the roofs of houses. The skylight has no base. Calculate the surface area of the acrylic needed for a square-based skylight that is 4′ wide and has a slant height of 2′.



$SA = \cancel{l^2} + 2ls$

$SA = 2ls$

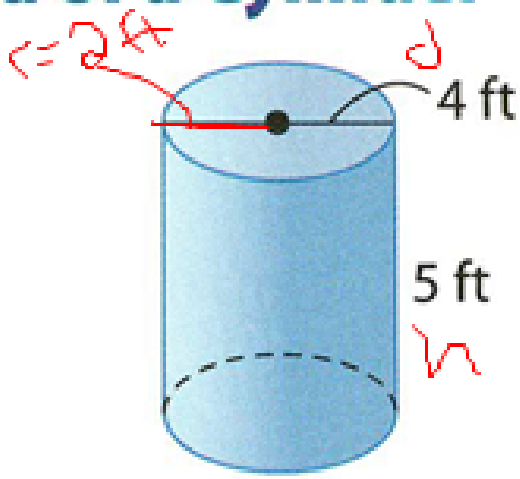
$SA = 2(4)(2)$

$SA = 16 ft^2$

They need $16 ft^2$ of acrylic.

Use a Formula to Calculate the Surface Area of a Cylinder

A cylindrical water tank needs to have a protective coating applied to its surface. Calculate the outer surface area of a tank that is 5 ft tall and has a diameter of 4 ft. Express your answer in square feet.

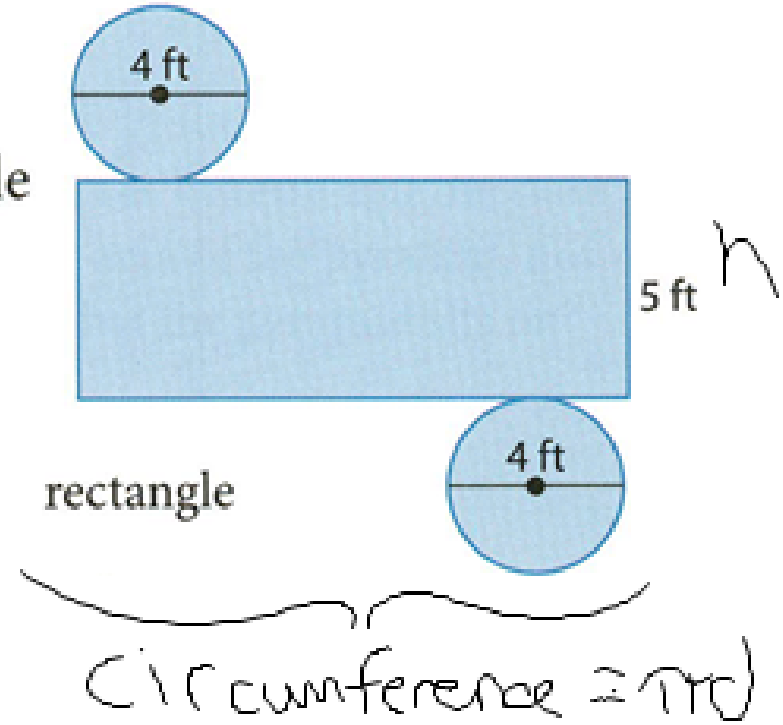


Remember: $d = 2r$

Last week, we would have unfolded this into a net, and found the area of each part.

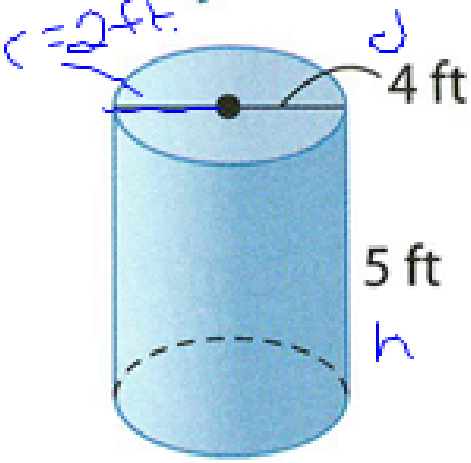
$SA = 2(\text{area of circular ends}) + \text{area of rectangle}$

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



Use a Formula to Calculate the Surface Area of a Cylinder

A cylindrical water tank needs to have a protective coating applied to its surface. Calculate the outer surface area of a tank that is 5 ft tall and has a diameter of 4 ft. Express your answer in square feet.



$SA = 2\pi r^2 + \pi d h$ ☆

$SA = 2\pi(2)^2 + \pi(4)(5)$ ☆ Biggest Step!

$SA = 2\pi(4) + \pi(20)$ ←

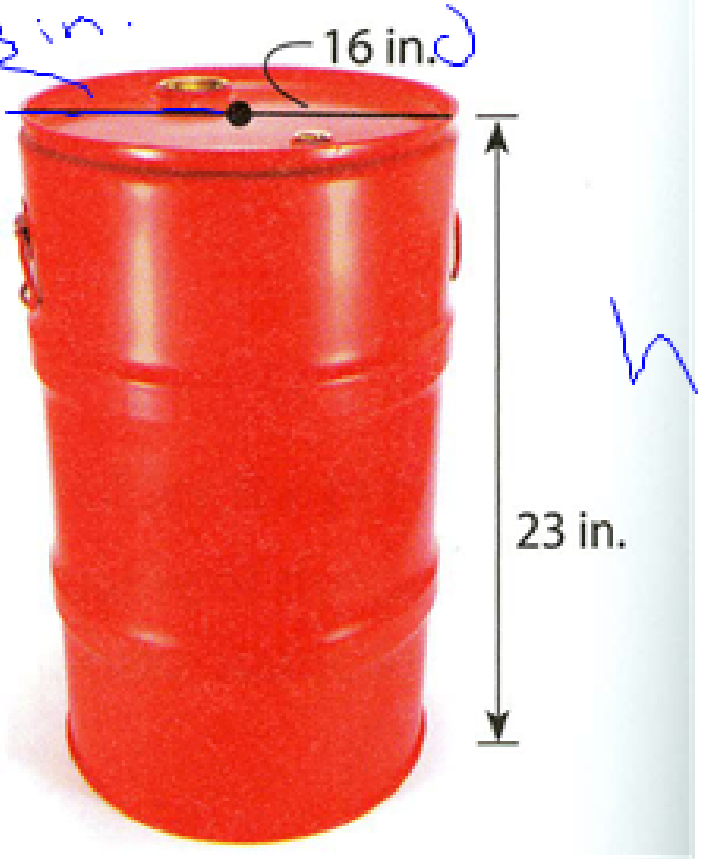
$SA = 25.1327\ ft^2 + 62.8319\ ft^2$ ☆

$SA = 87.9646\ ft^2$ ←

$SA = 87.96\ ft^2$ ☆

Your Turn

A plastic industrial drum has a diameter of 16 in. and a height of 23 in. What is the surface area of the drum? Express your answer to the nearest square inch.



$r = \frac{d}{2} = \frac{16}{2} = 8$ in.

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

$SA = 2\pi(8)^2 + \pi(16)(23)$

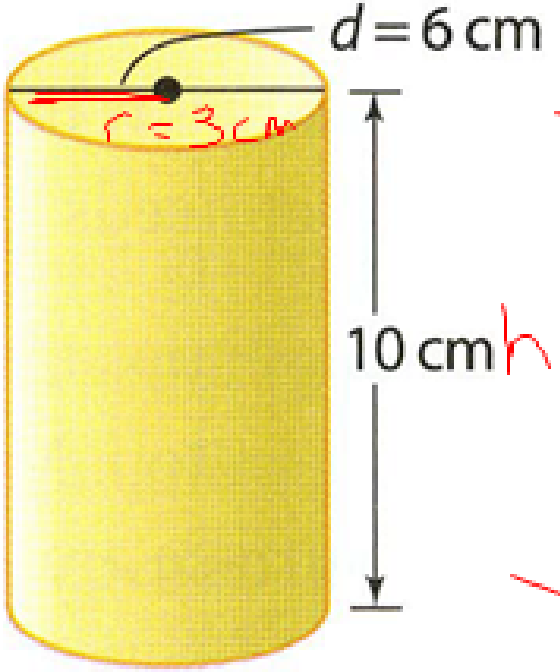
$SA = 2\pi(64) + \pi(368)$

$SA = 402.1238\,in^2 + 1156.106\,in^2$

$SA = 1558.2299\,in^2$

$SA = 1558\,in^2$

a)



$SA = 2\pi r^2 + \pi d h$

$SA = 2\pi(3)^2 + \pi(6)(10)$

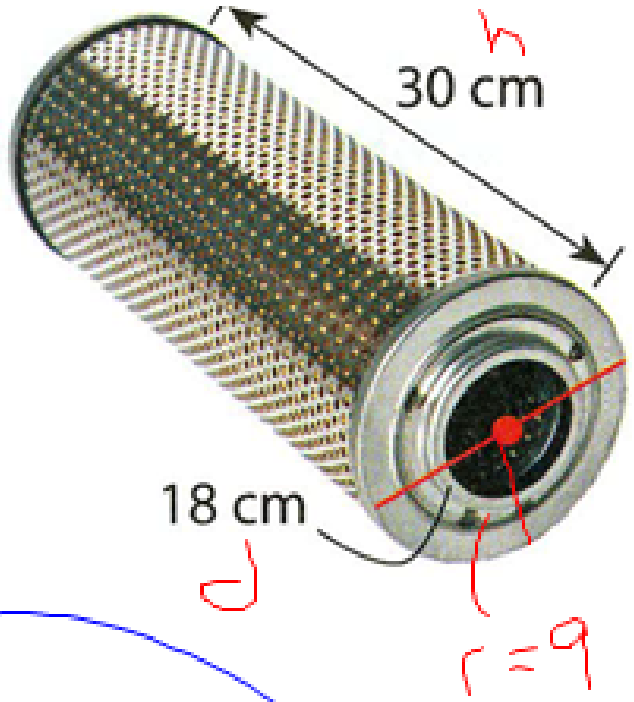
$SA = 2\pi(9) + \pi(60)$

$SA = 56.5486 + 188.4955$

$SA = 245.0441 \text{ cm}^2$

$SA = 245.04 \text{ cm}^2$

3. The air filter in some vehicles is cylindrical in shape. Determine the surface area of the mesh around the outside of this air filter. Express your answer to the nearest tenth of a square centimetre.



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

$SA = \pi dh$

$SA = \pi(18\text{ cm})(30\text{ cm})$

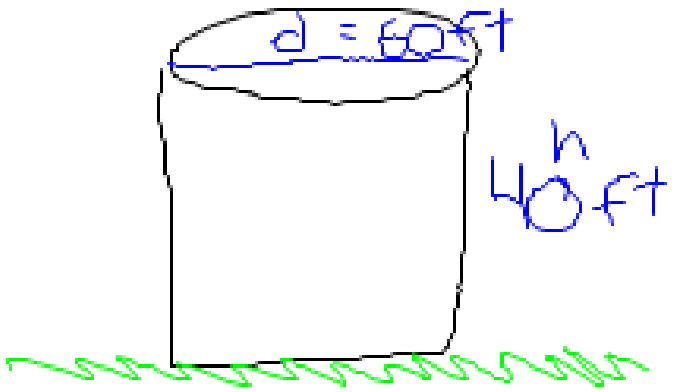
$SA = 1696.4600\text{ cm}^2$

$SA = 1696.5\text{ cm}^2$

So we need 1696.5 cm^2 of mesh

4. A cylindrical tank has an above-ground height of 40 ft and a diameter of 60 ft. Determine the exterior surface area of the above-ground part of the tank, to the nearest square foot.

Tank is on the ground.



$SA = 2\pi r^2 + \pi dh$ → Don't need the bottom.

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

$SA = \pi(30ft)^2 + \pi(60ft)(40ft)$

$SA = \pi(900ft^2) + \pi(2400ft^2)$

$SA = 2827.4333ft^2 + 7539.8223ft^2$

$SA = 10367.2556ft^2$

$SA = 10367ft^2$

$r = \frac{d}{2} = 30ft$

Homework: page 37, #1b, 2, and below

Complete the following formulas, identifying what each part represents. I have done the first one, to show you what I want.

$$Variables:$$

$$w = width$$

$$l = length$$

$$h = height$$

$$s = slant \quad height$$

Top/Bottom Rs Sides 4 Ends 2

$$SA_{Rectangular\ Prism} = 2lw + 2lh + 2wh$$

$$SA_{Triangular\ Prism} =$$

$$SA_{SquarePyramid} =$$

$$SA_{Cylinder} =$$