

$r =$  radius  
 $d =$  diameter

Variables :

$w =$  width

$l =$  length

$h =$  height

$s =$  slant height

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

Bottom / TOP      Sides      Ends

$$SA_{\text{Triangular Prism}} = lw + 2ls + wh$$

base      Sides      Ends

$$SA_{\text{Square Pyramid}} = l^2 + 2ls$$

sides

$$SA_{\text{Cylinder}} = 2\pi r^2 + \pi dh$$

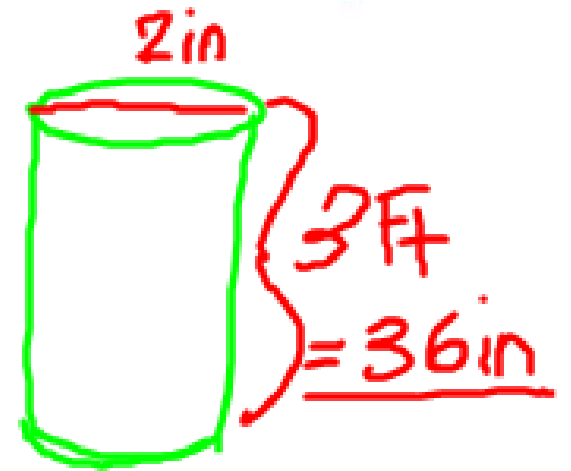
circle      middle

2. A tube is an open-ended cylinder. Calculate the surface area of a 3-foot-long cardboard tube that has a 2-inch diameter. Express your answer to the nearest square inch.

$$S.A. = \cancel{2\pi r^2} + \pi dh$$

$$S.A. = \pi (2)(36)$$

$$S.A. = 226 \text{ in}^2$$

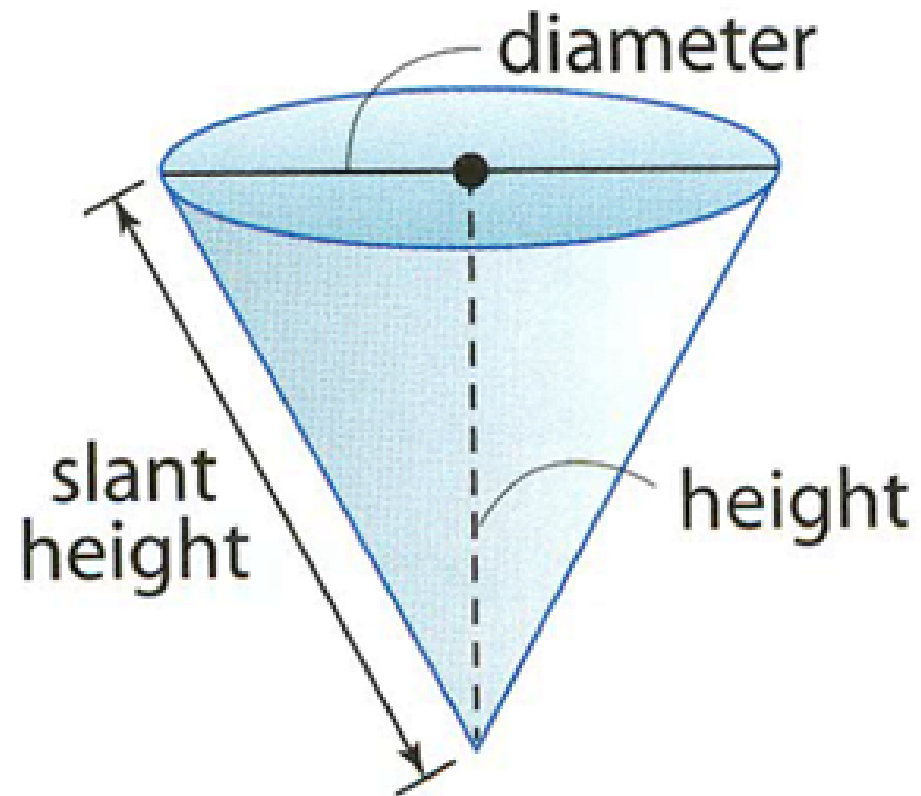
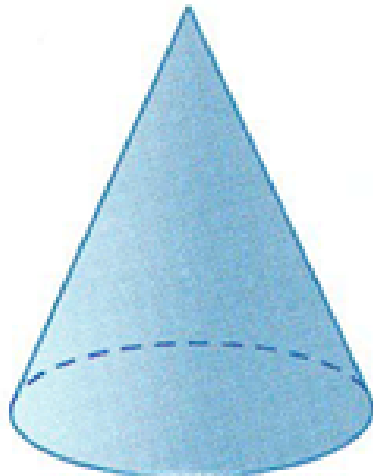


$$\frac{3 \cancel{\text{ft}} \times 12 \text{ in}}{1 \cancel{\text{ft}}} = \underline{36 \text{ in}}$$

# Finding the Surface Area of Cones

## cone

- a 3-D figure with a circular base and a curved surface that runs from the base to the highest point



How are we going to find the surface area of cones?

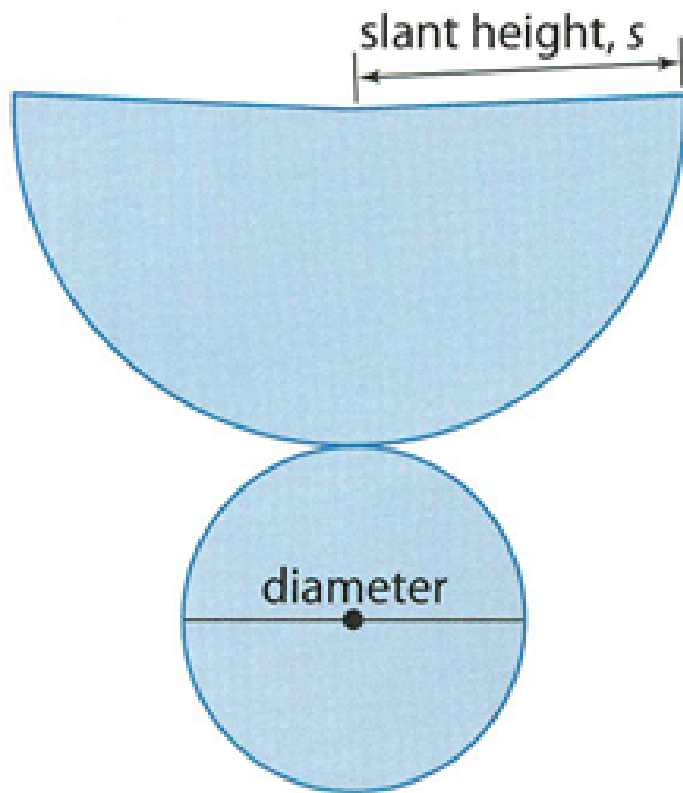
The net of a cone looks pretty odd...

SA = Area of the circle + Area of the curved part

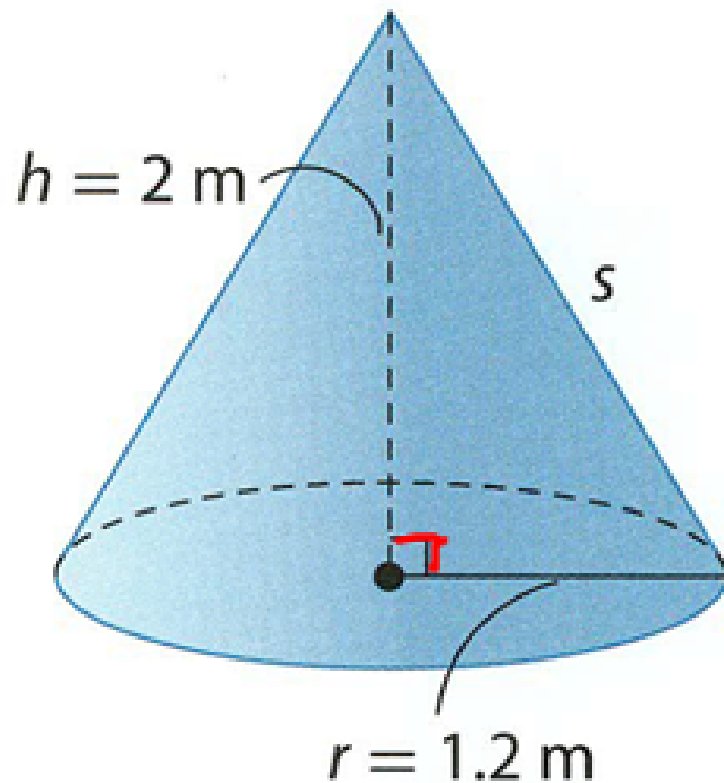
$$S.A_{\text{cone}} = \pi r^2 + \pi r s$$

$r$  = radius

$s$  = Slant height



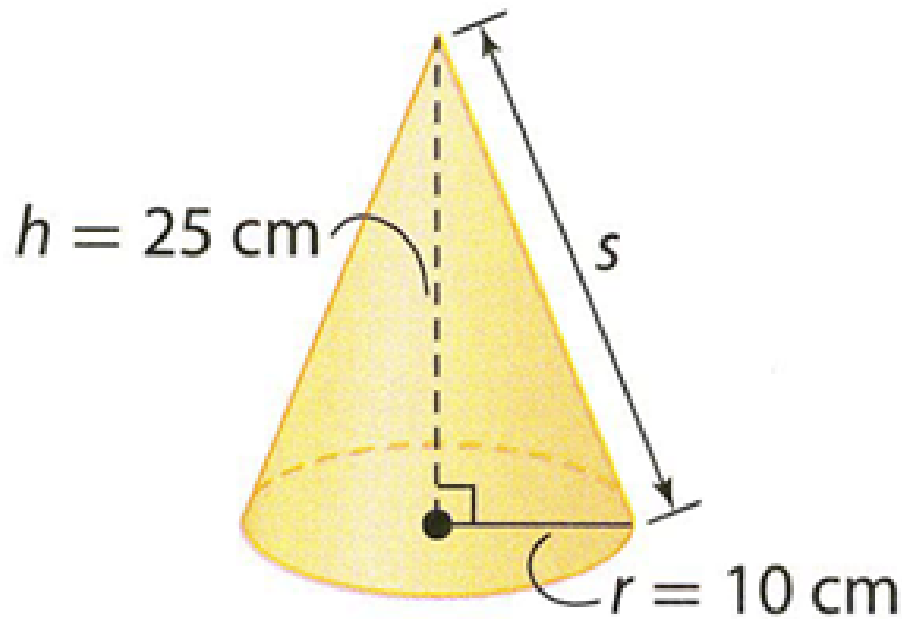
To find the surface area of a cone, we're ALWAYS going to need the slant height.



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 1.2^2 + 2^2 &= c^2 \\ 1.44 + 4 &= c^2 \\ \sqrt{5.44} &= \sqrt{c^2} \\ 2.33 &= c = s \end{aligned}$$

$$\begin{aligned} \text{S.A.} &= \pi r^2 + \pi r s \\ &= \pi (1.2)^2 + \pi (1.2)(2.33) \\ &= \pi (1.44) + \pi (2.796) \\ &= 4.5239\text{ m}^2 + 8.7829\text{ m}^2 = 13.31\text{ m}^2 \end{aligned}$$

a)



1)  $S =$

2)  $SA =$

$$S.A = \pi r^2 + \pi r s$$

$$S.A = \pi (10)^2 + \pi (10)(26.92)$$

$$= \pi (100) + \pi (269.2)$$

$$= 314.15 + 845.71$$

$$S.A = 1159.86 \text{ cm}^2$$

$$a^2 + b^2 = s^2$$

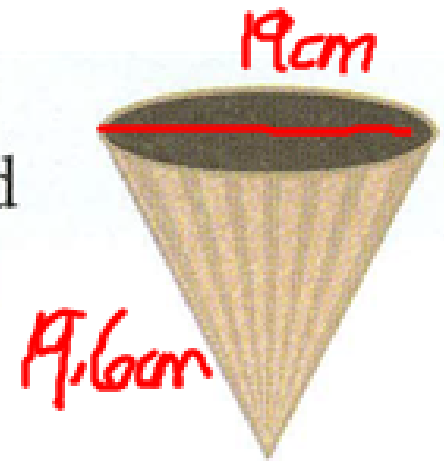
$$25^2 + 10^2 = s^2$$

$$625 + 100 = s^2$$

$$\sqrt{725} = \sqrt{s^2}$$

$$26.92 = s$$

6. Max has designed a reusable coffee filter in the shape of a cone. It has a diameter of 19 cm and a slant height of 19.6 cm. What is the surface area of the filter? Round your answer to the nearest tenth of a square centimetre.

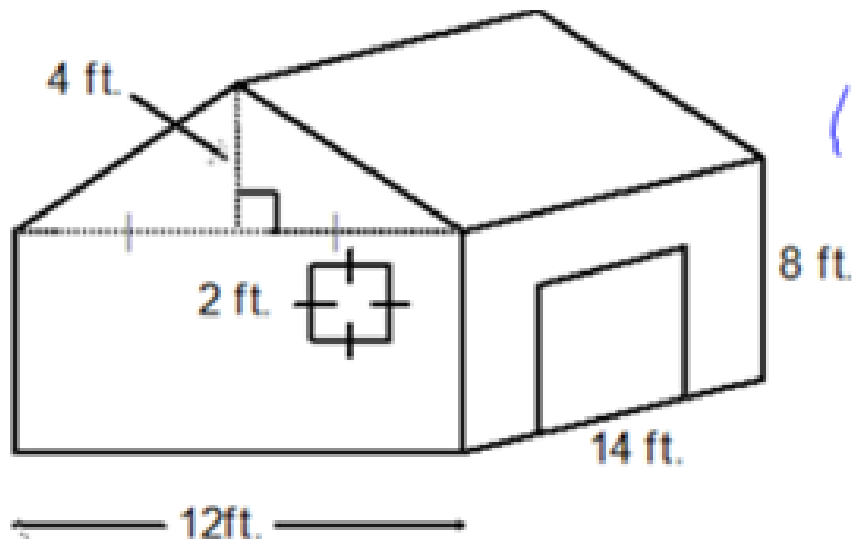


$$S.A = \cancel{\pi r^2} + \pi r s$$

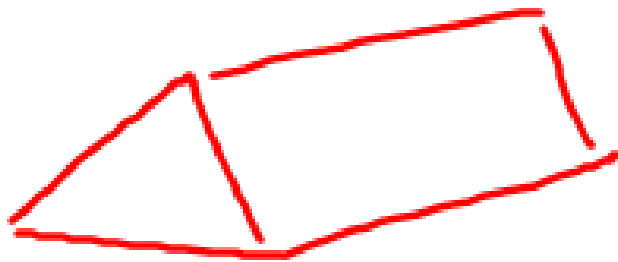
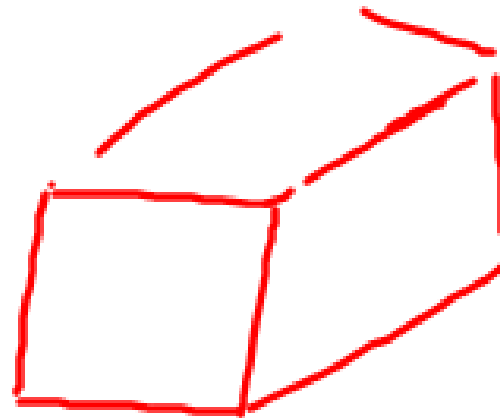
$$d = 19 \text{ cm}$$

$$\begin{aligned} S.A &= \pi (9.5)(19.6) \\ &= 585 \text{ cm}^2 \end{aligned}$$

$$r = \frac{19}{2} = 9.5 \text{ cm}$$



You are going to paint this house.  
Find the surface area to determine the amount of paint you will need.



$$S.A_{\text{TRIANGLE}} = \cancel{lw} + 2ls + wh$$

$$S.A_{\text{RECTANGLE}} = 2lh + \cancel{2lw} + 2wh$$



$$S.A_T = 2ls + wh$$

$$a^2 + b^2 = s^2$$

$$4^2 + b^2 = s^2$$

$$16 + 36 = s^2$$

$$\sqrt{52} = \sqrt{s^2}$$

$$7.2 = s$$

$$\begin{aligned} S.A &= 2(14)(7.2) + (12)(4) \\ &= 201.6 + 48 \end{aligned}$$

$$S.A_T = 249.6$$

$$S.A_R = 2lh + 2wh$$

$$= 2(12)(8) + 2(14)(8)$$

$$= 192 + 224$$

$$S.A = 416$$

$$S.A_T + S.A_R = 249.6 + 416$$

$$= 665.6 \text{ ft}^2$$