Lesson #3: Cones and Cylinders

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Learning Goal: We are learning to calculate the surface area and volume of cylinders and cones.

For each figure, draw the net, then calculate the surface area and the volume.

1.

Net:

$r = 3$

11 m

6 m

$2\pi r$

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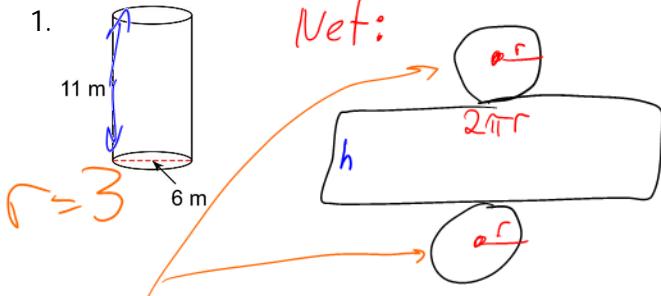
$SA = 2\pi r^2 + 2\pi r h$

$SA = 2(3.14)(3)^2 9 + 2(3.14)(3)(11)$

$SA = 56.52 + 207.24$

$SA = 263.76\, m^2$

$V = \pi r^2 h$

$V = (3.14)(3)^2 9 (11)$

$V = 310.86\, m^3$

2.

10 in

5 in

r

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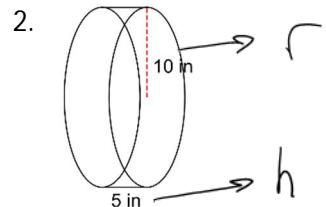
$SA = 2\pi r^2 + 2\pi r h$

$SA = 2(3.14)(10)^2 100 + 2(3.14)(10)(5)$

$SA = 628 + 314$

$SA = 942\, in^2$

$V = \pi r^2 h$

$V = (3.14)(10)^2 100 (5)$

$V = 1570\, in^3$

3.

14 km, 7 km

$r = 7$
$h = 14$
$S =$

Net:
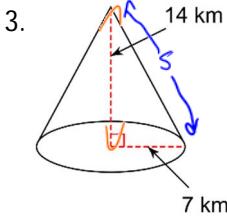
radius
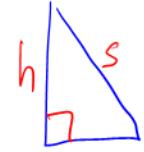
$a^2 + b^2 = c^2$
$r^2 + h^2 = S^2$
$7^2 + 14^2 = s^2$
$49 + 196 = s^2$
$\sqrt{245} = \sqrt{s^2}$

slant $S = 15.6$
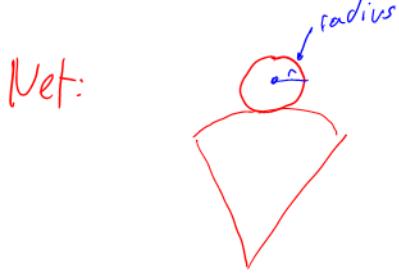
$SA = \pi r^2 + \pi r \boxed{S}$

$SA = (3.14)(\cancel{49}7) + (3.14)(7)(15.6)$

$SA = 153.86 + 342.89$

$SA = 496.75 \text{ km}^2$

$V = \dfrac{\pi r^2 h}{3}$

$V = \dfrac{(3.14)(\cancel{49}7)(14)}{3} = 718.01 \text{ km}^3$

4.

20 cm, 22.4 cm, = diameter

$r = 10$
$h = ? \; 20$
$S = 22.4$

$r^2 + h^2 = S^2$
$10^2 + h^2 = 22.4^2$
$100 + h^2 = 501.76$
$-100 \qquad\qquad -100$
$\sqrt{h^2} = \sqrt{401.76}$
$h = 20.04$

$SA = \pi r^2 + \pi r S$
$= (3.14)(10^2) + (3.14)(10)(22.4)$
$= 314 + 703.36$
$= 1017.36 \text{ cm}^2$

$V = \dfrac{\pi r^2 h}{3} = \dfrac{(3.14)(10^2)(20)}{3}$

$V = 2093.33 \text{ cm}^3$

Use the appropriate formula to solve for the missing measurement.

5. A Cylinder has a volume of 2769.48cm^3 with a height of 18cm. What is the length of the radius?

$V = \pi r^2 h$

$2769.48 = (3.14) r^2 (18)$

$\dfrac{2769.48}{56.52} = \dfrac{56.52 r^2}{56.52}$

$\sqrt{49} = \sqrt{r^2} \qquad r = ?$

$7 = r$

Success Criteria 56.52
- I can draw the net of a cylinder or cone
- I can use the appropriate formula to find the surface area or volume of a cone or cylinder
- If given the volume of a cone or cylinder, I can rearrange the equation to find the radius or height.