

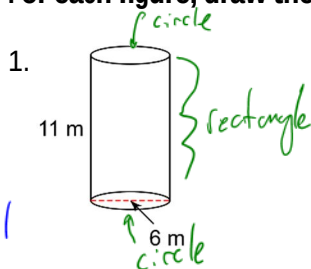
Math 9 – Unit 6: Measurement

Lesson #3: Cones and Cylinders

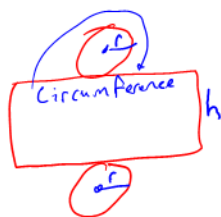
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Learning Goal: We are learning to calculate the surface area and volume of cylinders and cones.

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



$h = 11$
 $r = 3$



2 circles
 $SA = 2\pi r^2 + \underbrace{2\pi r h}_{\substack{lw \\ l \quad w}}$

$SA = 2(3.14)(\cancel{3}^2) + 2(3.14)(3)(11)$

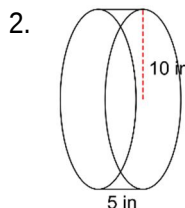
$SA = 56.52 + 207.24$

$SA = 263.76 \text{ m}^2$

$V = \pi r^2 h$

$V = (3.14)(\cancel{3}^2)(11)$

$V = 310.86 \text{ m}^3$



$r = 10$
 $h = 5$

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

$SA = 2(3.14)(\cancel{10}^2) + 2(3.14)(10)(5)$

$SA = 628 + 314$

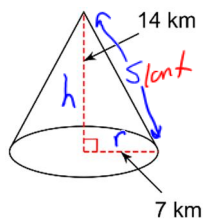
$SA = 942 \text{ in}^2$

$V = \pi r^2 h$

$V = (3.14)(\cancel{10}^2)(5)$

$V = 1570 \text{ in}^3$

3.



$$a^2 + b^2 = c^2$$

$$r^2 + h^2 = s^2$$

$$7^2 + 14^2 = s^2$$

$$49 + 196 = s^2$$

$$\sqrt{245} = \sqrt{s^2}$$

$$15.7 = s$$

$$r = 7$$

$$h = 14$$

$$s = 15.7$$

Net:



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

$$SA = (3.14)(7^2) + (3.14)(7)(15.7)$$

$$SA = 153.86 + 345.09$$

$$SA = 498.95 \text{ km}^2$$

$$V = \frac{\pi r^2 h}{3} = \frac{(3.14)(7^2)(14)}{3} = \frac{2154.04}{3} = 718.01 \text{ km}^3$$

Use the appropriate formula to solve for the missing measurement.

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

$$V = \pi r^2 h$$

$$\frac{2769.48}{(3.14)(18)} = \frac{(3.14)r^2(18)}{(3.14)(18)}$$

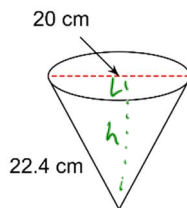
$$56.52 = r^2$$

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

Success Criteria

- 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.

4.



$$r = 10$$

$$s = 22.4$$

$$r^2 + h^2 = s^2$$

$$10^2 + h^2 = 22.4^2$$

$$100 + h^2 = 501.76$$

$$\sqrt{h^2} = \sqrt{401.76}$$

$$h = 20$$

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

$$SA = (3.14)(10^2) + (3.14)(10)(22.4)$$

$$SA = 314 + 703.36$$

$$SA = 1017.36 \text{ cm}^2$$

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

$$V = \frac{(3.14)(10^2)(20)}{3}$$

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

$$r_{\text{cm}} = \sqrt{\quad}$$