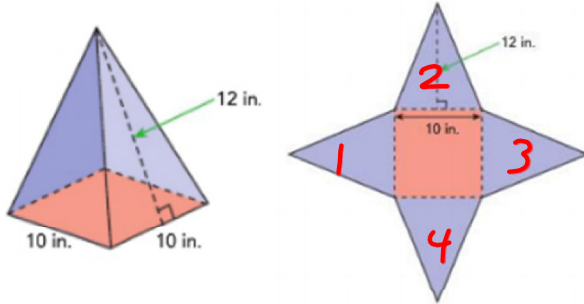


8.5 Day 2 – Surface Area of Pyramids and Cones-NOTES

Learning Targets:

- a. I can apply the surface area formulas to solve problems involving pyramids and cones.
- 1.) The following pyramid can be unfolded as follows:



Area of one triangle:  $\frac{1}{2}(10)(12) = 60$

Area of the square:  $(10)(10) = 100$

Total Area:  $(60)(4) + 100 = 340 \text{ in}^2$

**SURFACE AREA OF A PYRAMID:** The surface area  $S$  of a regular pyramid is the sum of the area of the base and the lateral faces.

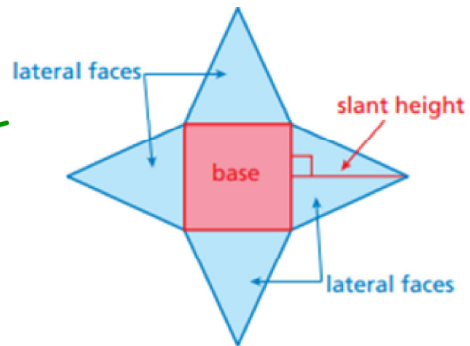
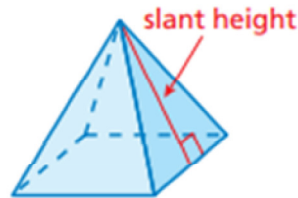
Formulas:

$S = LA + B$ , where:

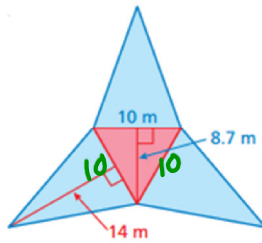
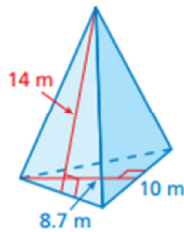
LA = Lateral Area    B = Area of Base

$S = \left(\frac{Pl}{2}\right) + B$ , where:

P = Perimeter of Base     $l$  = slant height



2.) Find the surface area of the regular pyramid. Use the net to find the area of the base and the area of a lateral face or use one of the formulas. Show all your work and round to the nearest tenth if necessary.



$$P = 10 + 10 + 10 = 30$$

$$l = 14$$

$$B = \frac{1}{2}(10)(8.7) = 43.5$$

$$SA = LA + B$$

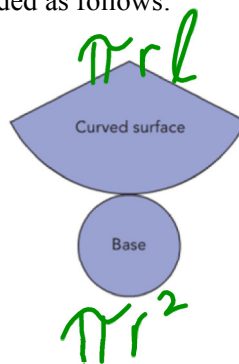
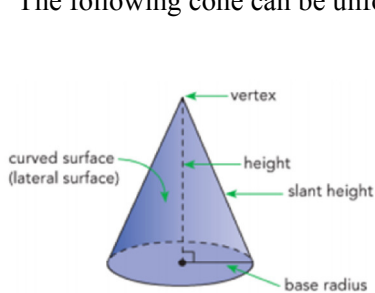
$$SA = \frac{Pl}{2} + B$$

$$SA = \frac{(30)(14)}{2} + 43.5$$

$$SA = 210 + 43.5$$

$$SA = 253.5 \text{ m}^2$$

The following cone can be unfolded as follows:



**SURFACE AREA OF A CONE :**

The surface area ( $S$ ) of a CONE is the sum of the area of the base and the lateral surface (LA) area.

**Formulas:**

$$LA = \pi r l$$

$$S = LA + B \text{ or}$$

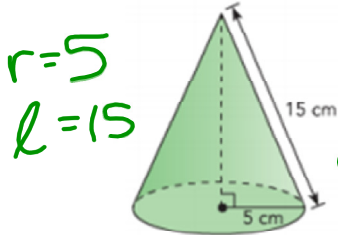
$$S = \pi r l + \pi r^2$$

Formulas:

$$LA = \pi r l$$

$$S = LA + B \quad \text{or}$$

$$S = \pi r l + \pi r^2$$



3.) Find the lateral area and the surface area of the following cones.

Show all your work and round to the nearest tenth if necessary.

LATERAL AREA:

$$S = \pi r l$$

$$S = \pi (5)(15)$$

$$S = 75\pi \text{ exact}$$

235.6 rounded

Total SURFACE AREA:

$$75\pi + 25\pi = 100\pi$$

$$235.6 + 78.5$$

$$= 314.1 \text{ cm}^2$$

BASE AREA:

$$B = \pi (5)^2 = 25\pi \text{ exact}$$

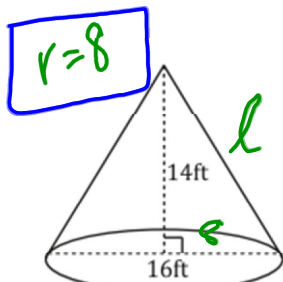
78.5 rounded

Formulas:

$$LA = \pi r l$$

$$S = LA + B \quad \text{or}$$

$$S = \pi r l + \pi r^2$$



3.) Find the lateral area and the surface area of the following cones.

Show all your work and round to the nearest tenth if necessary.

LATERAL AREA:

$$LA = \pi (8)(16.1)$$

$$LA = 128.8\pi$$

$$\approx 404.6$$

SURFACE AREA:

$$S = LA + B$$

$$404.6 + 201.1$$

$$605.7 \text{ ft}^2$$

Base Area

$$B = \pi (8)^2$$

$$= 64\pi$$

$$\approx 201.1$$

$$8^2 + 14^2 = l^2$$

$$64 + 196 = l^2$$

$$\sqrt{260} = \sqrt{l^2}$$

$$16.1 = l$$

Formulas:

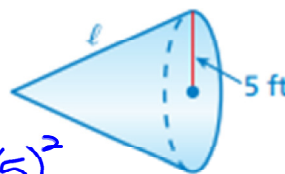
$$LA = \pi r l$$

$$S = LA + B \quad \text{or}$$

$$S = \pi r l + \pi r^2$$

4.) Find the slant height of the cone.

$$S = 60\pi \text{ ft}^2$$



$$S = \pi r l + \pi r^2$$

$$60\pi = \pi(5)l + \pi(5)^2$$

$$60 = 5l + 25$$

$$\begin{array}{r} 60 \\ -25 \\ \hline \end{array} = \begin{array}{r} 5l \\ -25 \\ \hline \end{array} + 25$$

$$\frac{35}{5} = \frac{5l}{5}$$

$$l = 7$$

Homework: SA of Pyramids and Cones

