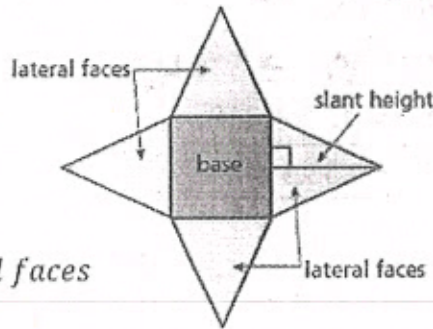


\*All sides of base are equal\*

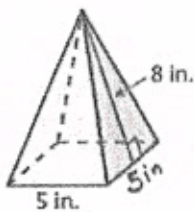
A **regular pyramid** is a pyramid whose base is a regular polygon. The lateral faces are triangles. The height of each triangle is the slant height of the pyramid.

The surface area,  $SA$ , of a pyramid is the sum of the areas of the base and the lateral faces.



$SA = \text{area of base} + \text{areas of lateral faces}$

**Example 1:** Find the surface area of the **regular** pyramid.



Draw a net.

**Area of Base**

$$A = lw$$

$$A = 5(5)$$

$$A = 25 \text{ in}^2$$

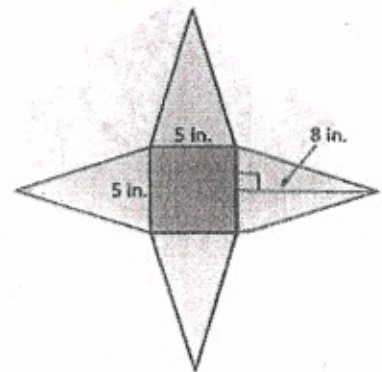
**Area of a Lateral Face**

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(5)(8)$$

$$A = \frac{1}{2}(40)$$

$$A = 20(4) = 80 \text{ in}^2 \quad \text{There are 4 identical lateral faces.}$$



$$SA = 25 + 80 = 105 \text{ in}^2$$

**Try This:**

- a. What is the **surface area** of a **square pyramid** with a base side length of **9 centimeters** and a **slant height** of **7 centimeters**?



Area Base

$$A = lw$$

$$A = 9 \cdot 9$$

$$A = 81 \text{ cm}^2$$

Area Lateral Faces (4)

$$A = 4\left(\frac{1}{2}bh\right)$$

$$A = 4\left(\frac{1}{2} \cdot 9 \cdot 7\right)$$

$$A = 4(31.5)$$

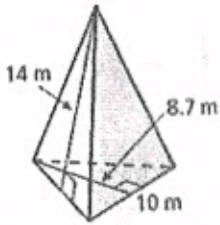
$$A = 126 \text{ cm}^2$$

Total SA

$$SA = 81 + 126$$

$$SA = 207 \text{ cm}^2$$

Example 2: Find the surface area of the regular pyramid.



Draw a net.

Area of Base

$$A = \frac{1}{2}bh$$

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

$$A = 43.5 \text{ m}^2$$

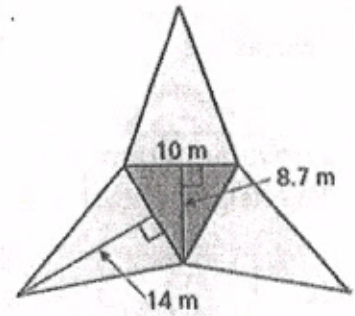
Area of a Lateral Face

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(10)(14)$$

$$A = 70(3) = 210 \text{ m}^2$$

There are 3 lateral faces.

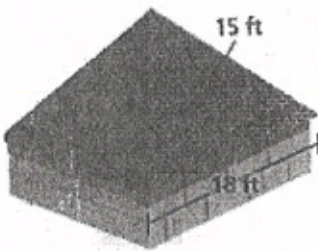


Add the areas together.

$$SA = 43.5 + 210$$

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

Example 3: A roof is shaped like a square pyramid. One bundle of shingles covers 25 square feet. How many bundles should you buy to cover the roof?



Area Roof

$$A = 4\left(\frac{1}{2}bh\right)$$

$$A = 4\left(\frac{1}{2} \cdot 18 \cdot 15\right)$$

$$A = 4(135)$$

$$A = 540 \text{ ft}^2$$

Number of Bundles

$$\frac{1 \text{ bundle}}{25 \text{ ft}^2} = \frac{x \text{ bundles}}{540 \text{ ft}^2}$$

$$25(x) = 1(540)$$

$$\frac{25x}{25} = \frac{540}{25}$$

$$x = 21.6 \text{ bundles}$$

You will need to buy 22 bundles to cover the roof.