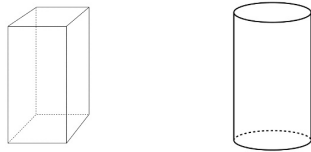
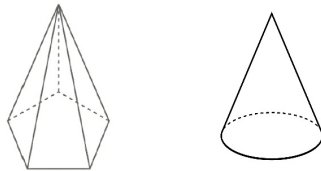


LAUNCH: What are some of the similarities and differences of each of the following pairs of solids:

A **prism** and a **cylinder** ?



A **pyramid** and a **cone** ?



3.14 Surface Area: Pyramids and Cones

Objectives:

- Interpret and use formulas for lateral areas and surface areas of pyramids and cones.

Pyramids- have one base that can be any polygon.
The lateral faces are polygons that have a common vertex called the apex.

Lateral Area: The area of the lateral faces of the pyramid

Surface Area: The lateral area plus the base of the pyramid

Formulas:

$$LA = \frac{1}{2}pl$$

$$SA = \frac{1}{2}pl + B$$

$V =$

Parts of the formula:

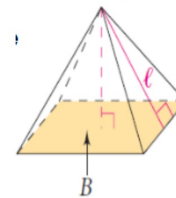
p = perimeter of the base

l = slant height

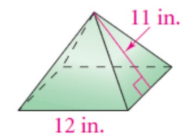
B = area of the base

PYRAMID

Picture(s):



Example:



Find the surface area of the pyramid:

pyramid

$$SA = \frac{1}{2}pl + B$$

$$P = 12 + 12 + 12 + 12 = 48 \text{ in}$$

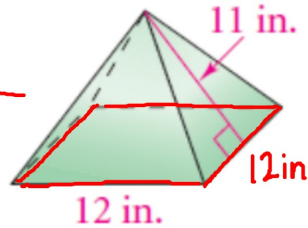
$$l = 11 \text{ in}$$

$$B = (12)(12) = 144 \text{ in}^2$$

$$SA = \frac{1}{2}(48)(11) + 144$$

$$= 264 + 144$$

$$= 408 \text{ in}^2$$



Cones- has one base that is a circle and a curved, smooth lateral surface that comes to a point called an apex.

Lateral Area: The area of the curved smooth surface of the cone.

Surface Area: The lateral area plus the base of the cone.

Formulas:

$$LA = \pi r l$$

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

$$V =$$

Parts of the formula:

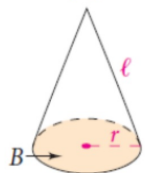
$$\pi = 3.14$$

r = radius

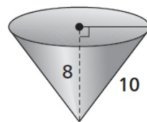
l = slant height

CONES

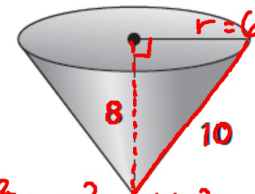
Picture(s):



Example:



Example: Find the lateral and total surface area for the cone



$$\begin{aligned} 8^2 + r^2 &= 10^2 \\ 64 + r^2 &= 100 \\ -64 & \\ \sqrt{r^2} &= \sqrt{36} \\ r &= 6 \end{aligned}$$

Cone

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

$$\pi = 3.14$$

$$r = 6$$

$$l = 10$$

$$\begin{aligned} SA &= (3.14)(6)(10) + (3.14)(6)^2 \\ &= (3.14)(6)(10) + (3.14)(36) \\ &= 188.4 + 113.04 \\ &= 301.44 \text{ u}^2 \end{aligned}$$

Homework: Worksheet Surface Areas of Pyramids and Cones

