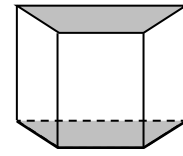


Prisms

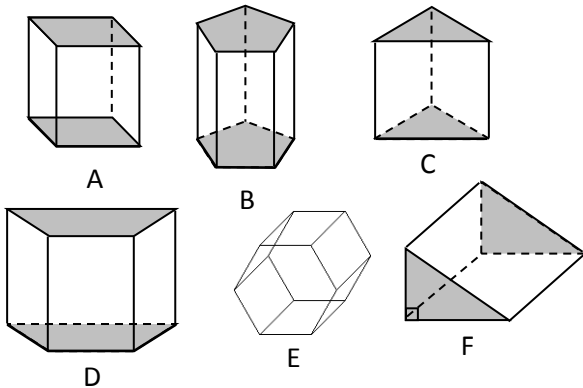
- **Bases** are congruent faces that are in parallel planes.
- Rectangular faces that are not bases are called **lateral faces**.
- Lateral faces intersect at lateral edges which are parallel segments.
- Height of a prism is the length of a segment that is perpendicular to both bases (also known as the altitude).



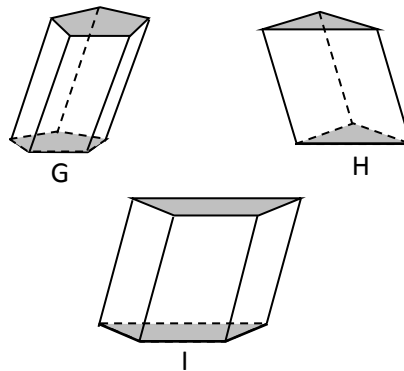
☆ Right Prisms versus Oblique Prisms

- In a right prism, its bases are perpendicular to its lateral edges.
- In an oblique prism, its bases are NOT perpendicular to its lateral edges.

Examples of Right Prisms:



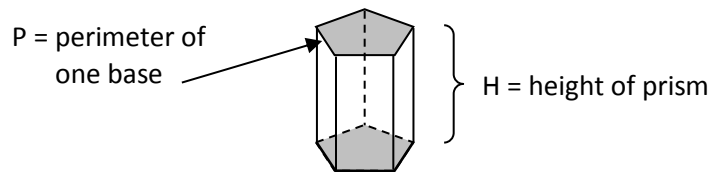
Examples of Oblique Prisms:

**Surface Area**

In general, the surface area is the sum of all the areas of all the shapes that cover the surface of the object.

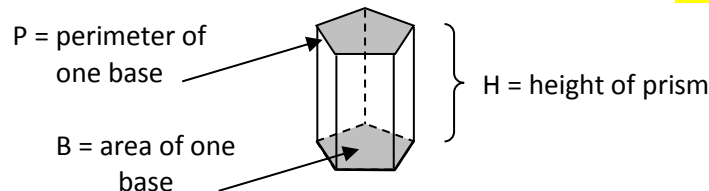
☆ Lateral Area of a Right Prism

- The sum of the areas of the lateral faces: **$L = PH$**



☆ Surface Area of a Right Prism

- The sum of the areas of the lateral faces and bases: **$S = 2B + PH$**

**Formulas for area:**

Square

$$A = s^2$$

Rectangle

$$A = \ell \times w$$

Parallelogram

$$A = b \times h$$

Triangle

$$A = \frac{1}{2} \times b \times h$$

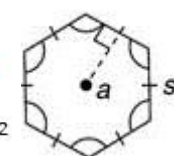
Trapezoid

$$A = \frac{(a+b)}{2} \times h$$

Circle

$$A = \pi \times r^2$$

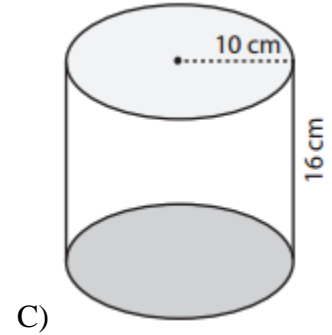
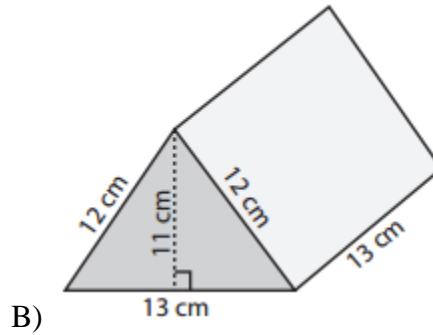
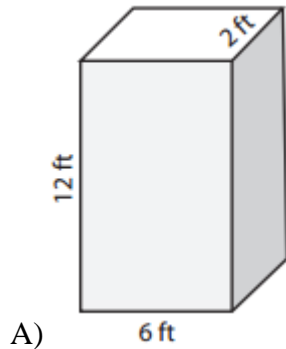
regular polygon



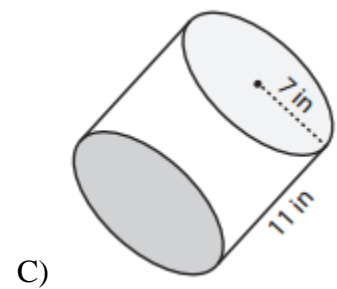
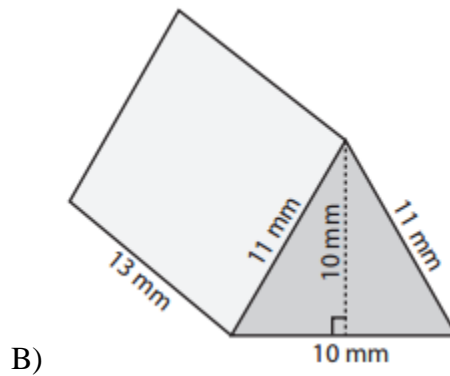
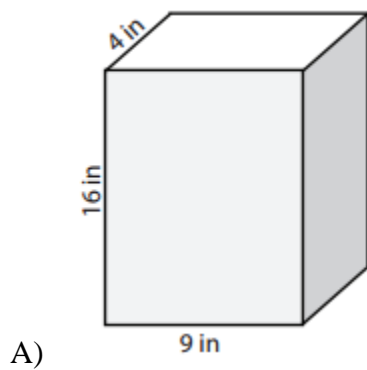
$\frac{1}{2}ap$
 $p = \text{perimeter}$
 $a = \text{apothem}$

In order to find the **total surface area of a prism**, we must first 1) find the perimeter of one of the bases 2) multiply the perimeter by the height of the prism 3) find the area of one of the bases 4) multiply the area by 2 5) add the two products together.

Example 1: Find the surface area of the following prisms

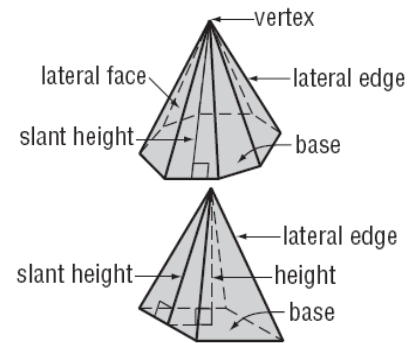


Practice 1: Find the surface area of the following prisms



Pyramids

- They have only one **base** and it is always a polygon.
- The faces that are not the base are called lateral faces.
- Lateral faces are triangles and they intersect at the vertex.
- Lateral edges also intersect at the vertex.
- The altitude (height) of a prism is the perpendicular segment that extends from the vertex to the base.
- If the base is a regular polygon, then the pyramid is called a regular pyramid. In a regular pyramid, the altitude “hits” the center of the base and all the lateral faces are congruent isosceles triangles.
- The **slant height** is the height of a lateral face in a regular pyramid.

☆ **Lateral Area of a Regular Pyramid**

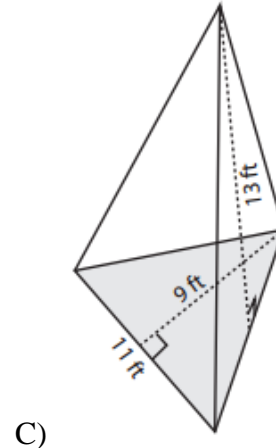
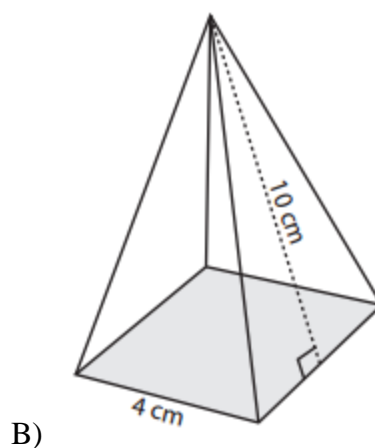
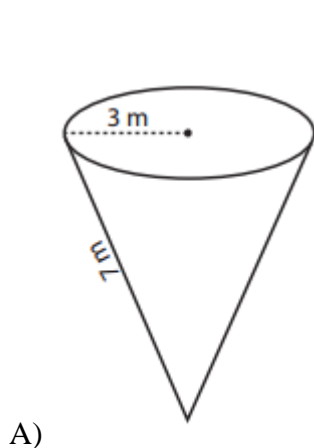
- The sum of the areas of the lateral faces: $L = Pl$

☆ **Surface Area of a Regular Pyramid**

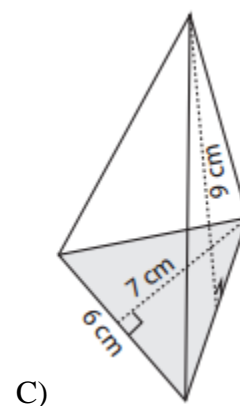
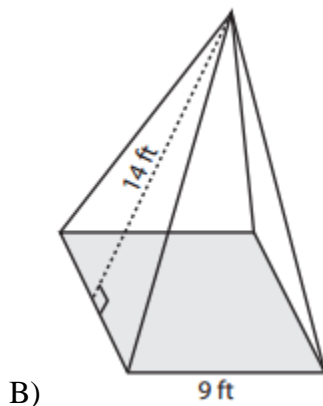
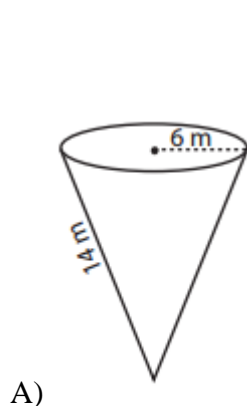
The sum of the areas of the lateral faces plus its base: $S = B + \frac{1}{2}Pl$

In order to find the **total surface area of a pyramid**, we must 1) find the area of the base 2) find the perimeter of the base 3) multiply the perimeter of the base by the slant height 4) divide that by 2 5) add that number and the area of the base together

Example 2: Find the surface area of the following pyramids



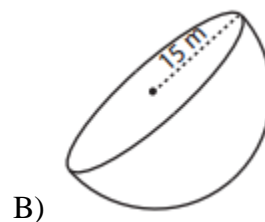
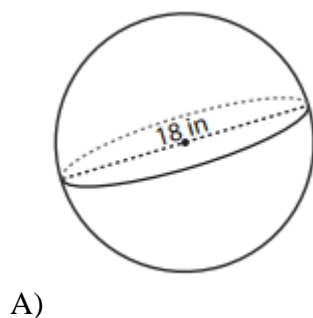
Practice 2: Find the total surface area of the following pyramids



Spheres

The formula for the surface area of a sphere is $S = 4\pi r^2$. The total surface area of a hemisphere is $S = 3\pi r^2$.

Example 3: Find the total surface area of the sphere or hemisphere.



Practice 3: Find the total surface area of a sphere or hemisphere.

