

# Geometry

## 12.2 Surface Area of Prisms and Cylinders

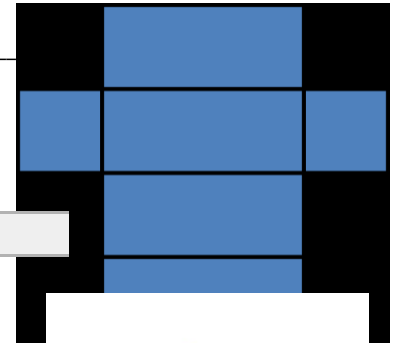
### Surface Area



- Surface area = \_\_\_\_\_
  - In order to calculate surface area it is sometimes easier to \_\_\_\_\_

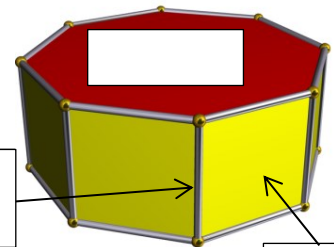
### Nets

- Imagine cutting the three dimensional figure along \_\_\_\_\_
- Start by drawing one surface, then \_\_\_\_\_.
- To find the surface area, \_\_\_\_\_ of the net.



### Parts of a Right Prism

- Bases → parallel congruent surfaces \_\_\_\_\_
- Lateral faces → the other faces (they are \_\_\_\_\_)
- Lateral edges → intersections of the lateral faces (they are \_\_\_\_\_)
- Altitude → segment \_\_\_\_\_ to the planes containing the two bases with an endpoint on each plane
- Height → \_\_\_\_\_

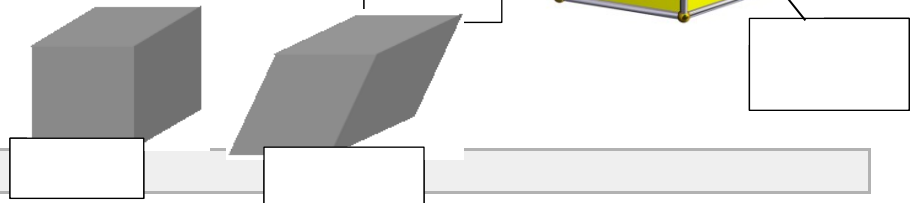


### Right prism

- Prism where the lateral edges are \_\_\_\_\_

### Oblique prism

- \_\_\_\_\_



### Surface Area

#### Lateral Area ( $L$ ) of Prisms

- Area of the \_\_\_\_\_
- $L =$  \_\_\_\_\_
  - $L =$  \_\_\_\_\_
  - $P =$  \_\_\_\_\_
  - $h =$  \_\_\_\_\_

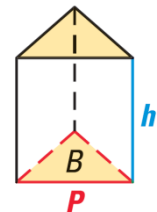
#### Base Area ( $B$ )

- In a prism, both bases are congruent, so you only need to find the area of one base and multiply by two

### Surface Area of a Right Prism

$$S = \underline{\hspace{2cm}}$$

Where  $S$  = surface area,  $B$  = base area,  $P$  = perimeter of base,  $h$  = height of prism

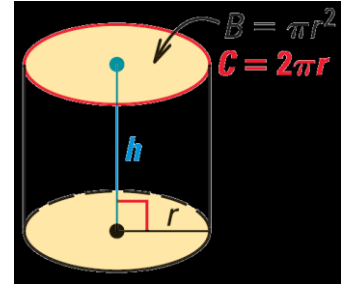


Draw a net for a triangular prism.

Find the lateral area and surface area of a right rectangular prism with height 7 inches, length 3 inches, and width 4 inches.

**Surface Area of Cylinders**

- Cylinders are the same as prisms except the bases are \_\_\_\_\_
  - Lateral Area =  $L =$  \_\_\_\_\_



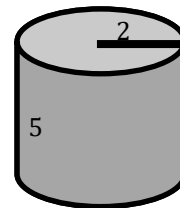
**Surface Area of a Right Cylinder**

$S =$  \_\_\_\_\_

Where  $S$  = surface area,  $r$  = radius of base,  $h$  = height of prism

The surface area of a right cylinder is  $100 \text{ cm}^2$ . If the height is 5 cm, find the radius of the base.

Draw a net for the cylinder and find its surface area.

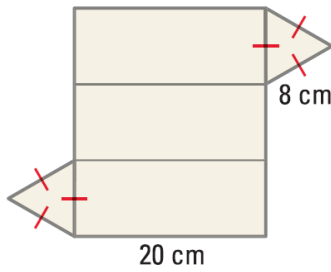


Assignment: Attached worksheet

**Assignment:**

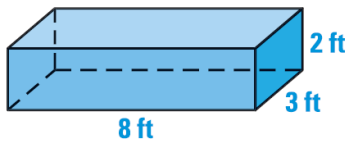
1. Explain how the formula  $S = 2B + Ph$  applies to find the surface area of both a right prism and a right cylinder.

**Find the surface area of the solid formed by the net. Round your answers to two decimal places.**

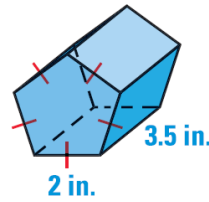


2.

**Find the lateral area and surface area of the right prism. Round your answers to two decimal places.**



3.



4.

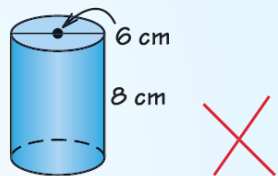
**Find the lateral area and surface area of the right cylinder using the given radius  $r$  and height  $h$ . Round your answers to two decimal places.**

5.  $r = 12$  mm,  $h = 40$  mm



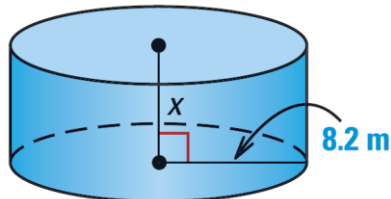
6. Describe and correct the error in finding the surface area of the right cylinder.

$$\begin{aligned} S &= 2\pi(6^2) + 2\pi(6)(8) \\ &= 2\pi(36) + 2\pi(48) \\ &= 168\pi \\ &\approx 528 \text{ cm}^2 \end{aligned}$$



**Solve for  $x$  given the surface area  $S$  of the right prism or right cylinder. Round your answer to two decimal places.**

7.  $S = 1097 \text{ m}^2$



8. A triangular prism with a right triangular base has leg length 9 units and hypotenuse length 15 units. The height of the prism is 8 units. Sketch the prism and find its surface area.

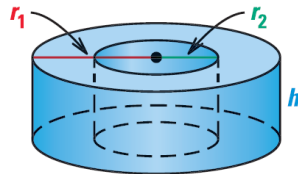
9. The radius and height of a right cylinder are each divided by  $\sqrt{5}$ . What is the change in surface area of the cylinder?

10. Find the height of a cylinder with a surface area of  $108\pi$  square meters. The radius of the cylinder is twice the height.

11. A bass drum has a diameter of 20 inches and a depth of 8 inches. Find the surface area of the drum.



12. A right cylinder has a radius of 4 feet and height of 10 feet.  
 a) Find the surface area of the cylinder.  
 b) Suppose you can either *double the radius* or *double the height*. Which do you think will create a greater surface area?  
 c) Check your answer in part (b) by calculating the new surface areas.
13. A company makes two types of recycling bins. One type is a right rectangular prism with length 14 inches, width 12 inches, and height 36 inches. Both types of bins are missing a base, so the bins have one open end. Which bin requires more material to make? *Explain*.
14. The ring shown is a right cylinder of radius  $r_1$  with a cylindrical hole of radius  $r_2$ . The ring has height  $h$ .  
 a) Find the surface area of the ring if  $r_1$  is 12 meters,  $r_2$  is 6 meters, and  $h$  is 8 meters. Round your answer to two decimal places.  
 b) Write a formula that can be used to find the surface area  $S$  of any cylindrical ring where  $0 < r_2 < r_1$ .



**Mixed Review**

The sum of the measures of the interior angles of a convex polygon is given. Classify the polygon by the number of sides.

15.  $1080^\circ$

16.  $720^\circ$

17.  $1800^\circ$

Find the area of the regular polygon.

