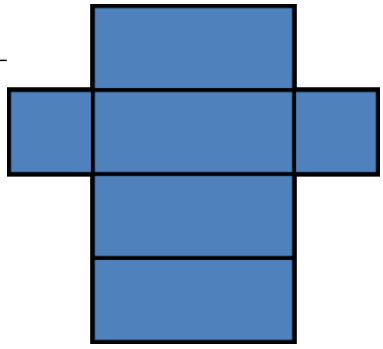
Geometry

12.2 Surface Area of Prisms and Cylinders

Surface Area

- Surface area = _____
  - In order to calculate surface area it is sometimes easier to_____

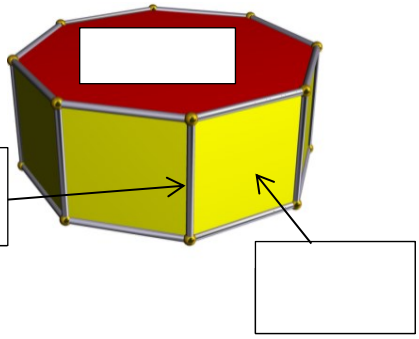
Nets



- 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 → _____

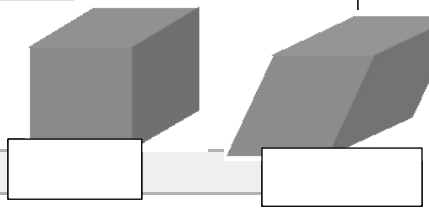


Right prism

- Prism where the lateral edges are _____

Oblique prism

- _____



Surface Area

Lateral Area (L) of Prisms

- Area of the _____
- ***L*** =_____
  - L = _____
  - P = _____
  - h = _____

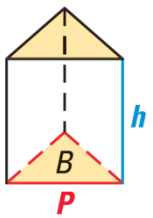
Base Area (B)

- 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 = _____

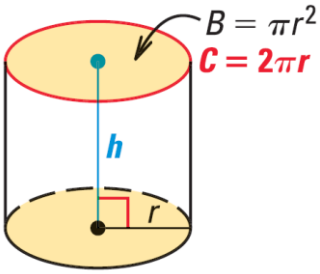
Where *S* = surface area, *B* = base area, *P* = perimeter of base, *h* = height of prism



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 = _____

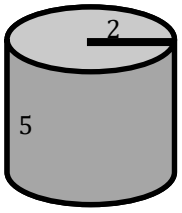
Surface Area of a Right Cylinder

S=_____

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

The surface area of a right cylinder is 100 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.



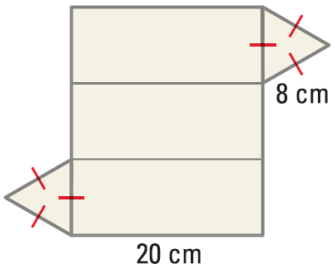
Assignment: Attached worksheet

Geometry 12.2 Name: _____

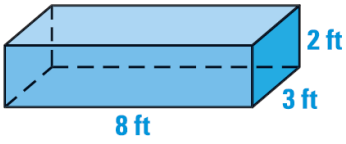
Assignment:

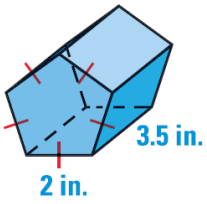
1. *Explain* how the formula $S = 2B + Ph$ applies to find the surface area of both a right prism and a right cylinder.

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. 

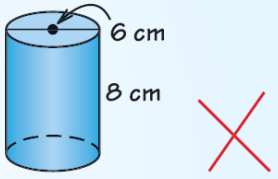
4. 

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

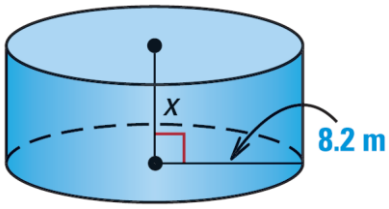
6. *Describe* and correct the error in finding the surface area of the right cylinder.

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



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

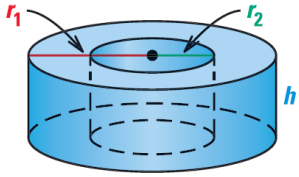
7. $S = 1097$ m^2



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 108π 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 recycling bins. One type is a right rectangular prism with length 14 inches, width 12 inches, and height 36 inches. The bins are missing a base, so the bins have one open end. How much material is required to make the bin?
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 $0 < r_2 < r_1$.



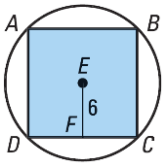
Mixed Review

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

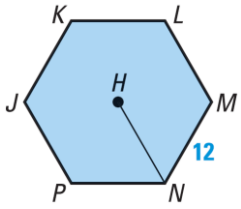
15. 1080°
16. 720°
17. 1800°

Find the area of the regular polygon.

18.



19.



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