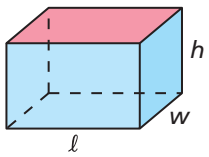
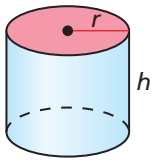
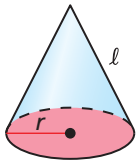
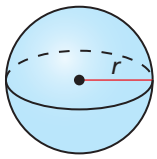
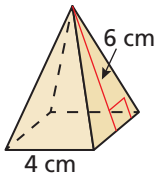
Name _____ Date _____

Surface Area

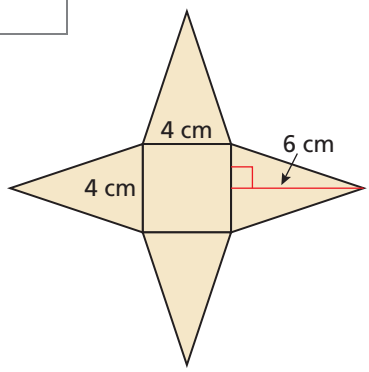
A **solid** is a three-dimensional figure that encloses a space. The **surface area** of a solid is the sum of the areas of all of its faces. Surface area is measured in *square units*. You can use a two-dimensional representation of a solid, called a **net**, to find the surface area of a solid. You can also use the following formulas to find surface areas.

Rectangular Prism	Cylinder	Cone	Sphere
			
$S = 2\ell w + 2\ell h + 2wh$	$S = 2\pi r^2 + 2\pi rh$	$S = \pi r^2 + \pi r\ell$	$S = 4\pi r^2$

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



Draw a net.



Area of Base

$4 \cdot 4 = 16$

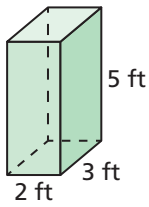
Area of a Lateral Face

$\frac{1}{2} \cdot 4 \cdot 6 = 12$

There are four identical lateral faces. So, the surface area is $16 + 4(12) = 64$ square centimeters.

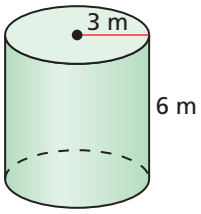
Example 2 **Find the surface area of each solid.**

a.



$$\begin{aligned} S &= 2\ell w + 2\ell h + 2wh \\ &= 2(2)(3) + 2(2)(5) + 2(3)(5) \\ &= 12 + 20 + 30 \\ &= 62 \text{ ft}^2 \end{aligned}$$

b.



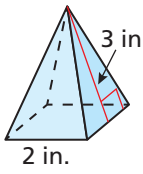
$$\begin{aligned} S &= 2\pi r^2 + 2\pi rh \\ &= 2\pi(3)^2 + 2\pi(3)(6) \\ &= 18\pi + 36\pi \\ &= 54\pi \approx 170 \text{ m}^2 \end{aligned}$$

Practice

Check your answers at BigIdeasMath.com.

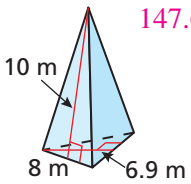
Find the surface area of the regular pyramid.

1.



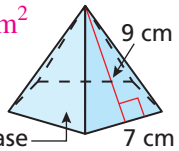
16 in.^2

2.



147.6 m^2

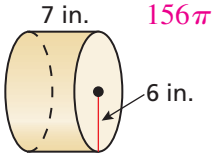
3.



241.8 cm^2

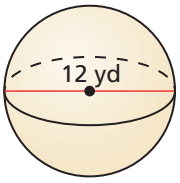
Find the surface area of the solid.

4.



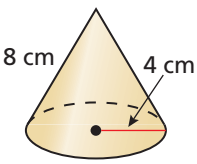
$156\pi \approx 490 \text{ in.}^2$

5.



$144\pi \approx 452 \text{ yd}^2$

6.



$48\pi \approx 151 \text{ cm}^2$