Key Lesson Marker

The formula for the surface area of a sphere is

$SA_{sphere} = 4\pi r^2$

r is the radius of the sphere

Example 4

Determine the surface area of a sphere with a diameter of 15 feet, to the nearest square foot.

radius $= \dfrac{\text{diameter}}{2}$

radius $= \dfrac{15 \text{ ft}}{2}$

radius $= 7.5$ ft

$SA_{sphere} = 4\pi r^2$

$SA_{sphere} = 4\pi(7.5 \text{ ft})^2$

$SA_{sphere} = 4\pi \cdot 56.25 \text{ ft}^2$

$SA_{sphere} \doteq 707 \text{ ft}^2$

The surface area of a sphere with a diameter of 15 feet is 707 square feet.

Check Up

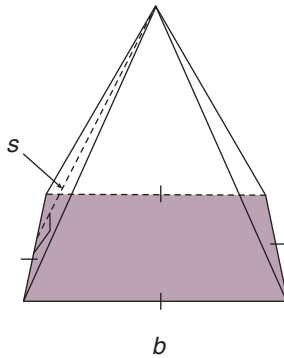1. State the general surface area formulas for the following objects.

   Right Pentagonal Pyramid

   Right Rectangular Prism

   Right Cone

   Sphere

2. Formulate the general surface area formula for the pyramid below.

s

b

☑ Compare your answers.

1. State the general surface area formulas for the following objects.

Right Pentagonal Pyramid

$$SA_{\text{right pentagonal pyramid}} = 5\left(\frac{sb}{2}\right) + 5\left(\frac{ab}{2}\right)$$

Right Rectangular Prism

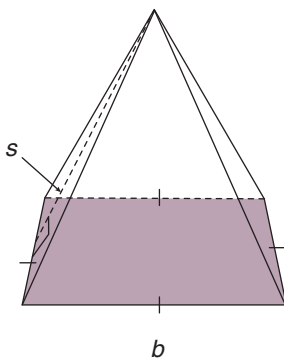$$SA_{\text{right rectangular prism}} = 2lw + 2hw + 2lh$$

Right Cone

$$SA_{\text{right cone}} = \pi r^2 + \pi rs$$
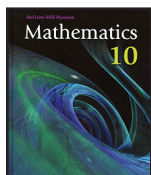
Sphere

$$SA_{\text{sphere}} = 4\pi r^2$$

2. Formulate the general surface area formula for the pyramid below.

s

b

$$SA_{\text{right square pyramid}} = \text{area of square base } + \text{ area of 4 equal triangles}$$
$$SA_{\text{right square pyramid}} = b^2 + 4\left(\frac{sb}{2}\right)$$
$$SA_{\text{right square pyramid}} = b^2 + 2sb$$

For more examples about calculating surface area of a cone, pyramid, or sphere see pp. 69 to 71 of *Mathematics 10*.