Review Exercise Set 29

Exercise 1:   Find the volume of a rectangular solid that has a length of 4 ft, a width of 2 ft and a
height of 2.5 ft.

Exercise 2:   The height of a cylinder is 6 m and the radius of the base is 3 m. Find the volume of the
cylinder.

Exercise 3:   The height of a pyramid is 20 ft, and the length of a side of the base is 9 ft. What is the
volume of the pyramid?

Exercise 4:   Find the surface area of a solid cube with sides 5 inches.

Exercise 5:   Find the surface area of a sphere with a diameter of 12 cm. Give the exact
               measurement.

Review Exercise Set 29 Answer Key

Exercise 1: Find the volume of a rectangular solid that has a length of 4 ft, a width of 2 ft and a height of 2.5 ft.

The volume of a rectangular solid is equal to the length times the width times the height.

V = lwh

Substitute in the given values for the sides and evaluate.

V = (4 ft)(2 ft)(2.5 ft)
V = 20 ft^3

The volume of the rectangular solid is 20 cubic feet.

Exercise 2: The height of a cylinder is 6 m and the radius of the base is 3 m. Find the volume of the cylinder.

The volume of a cylinder is equal to pi times the radius squared times the height.

$$V = \pi r^2 h$$

Substitute in the given values and evaluate.

$$V = \pi \left(3\, m\right)^2 \left(6\, m\right)$$
$$V = \pi \left(9\, m^2\right)\left(6\, m\right)$$
$$V = 54\pi\ m^3$$
$$V \approx 54\left(3.14\right) m^3$$
$$V \approx 169.56\ m^3$$

The exact volume of the cylinder would be 54 π cubic meters, which would be approximately 169.56 cubic meters.

Exercise 3:   The height of a pyramid is 20 ft, and the length of a side of the base is 9 ft. What is the volume of the pyramid?

The volume of a pyramid is equal to one-third times the length of a side squared times the height.

$$V = \frac{1}{3}\, s^2 h$$

Substitute in the given values and evaluate.

$$V = \frac{1}{3}\, (9\text{ ft})^2(20\text{ ft})$$

$$V = \frac{1}{3}\, (81\text{ ft}^2)(20\text{ ft})$$
$$V = (27\text{ ft}^2)(20\text{ ft})$$
$$V = 540\text{ ft}^3$$

The volume of the pyramid is 540 cubic feet.

Exercise 4:   Find the surface area of a solid cube with sides 5 inches.

The surface area of a solid cube would be the sum of the surface areas of each side. The surface area of a single side would be equal to the area of a square which is the length of a side squared (s^2). A solid cube will have a total of six identical sides so the total surface area would be six times the area of one side.

$$SA = 6s^2$$

Substitute in the given values for the sides of the cube and evaluate.

$$SA = 6s^2$$
$$SA = 6(5\text{ in})^2$$
$$SA = 6(25\text{ in}^2)$$
$$SA = 150\text{ in}^2$$

The surface area of the solid cube is 150 square inches.

Exercise 5:   Find the surface area of a sphere with a diameter of 12 cm. Give the exact measurement.

The surface area of a sphere is equal to four times pi times the radius squared.

$$SA = 4\pi r^2$$

We were given the diameter of the sphere instead of the radius. However, the diameter is equal to twice the radius, so we can divide the diameter in half to find the radius.

$$r = \frac{1}{2}\ d$$
$$r = \frac{1}{2}\ (12\ cm)$$
$$r = 6\ cm$$

Now substitute in the value for the radius and evaluate.

$$SA = 4\pi r^2$$
$$SA = 4\pi \left(6\ cm\right)^2$$
$$SA = 4\pi \left(36\ cm^2\right)$$
$$SA = 144\pi\ cm^2$$

or

$$SA \approx 144\left(3.14\right)cm^2$$
$$SA \approx 452.16\ cm^2$$

The exact surface area of the sphere is 144π square centimeters, which would be approximately 452.16 square centimeters.