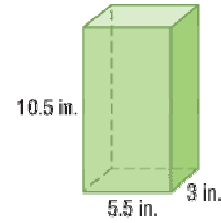


Lesson 5-6

Example 1

PACKAGING A box of Sweet Treats cereal is 10.5 in. high and 5.5 in. wide and 3 in. deep. What is the surface area of the box?



Solution

The cereal box is a rectangular prism, so it has 3 pairs of congruent rectangular faces. To find its surface area, find the area of each face. Use the formula $A = \ell w$.

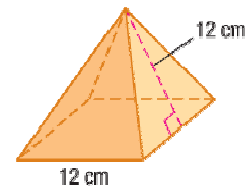
SA means “surface area”

$$\begin{aligned} SA &= 2(\text{area of front}) + 2(\text{area of side}) + 2(\text{area of top}) \\ &= 2(10.5 \times 5.5) + 2(10.5 \times 3) + 2(5.5 \times 3) \\ &= 111.5 + 63 + 33 \\ &= 211.5 \end{aligned}$$

The surface area is 211.5 in^2 .

Example 2

MANUFACTURING At Farrow’s Ceramic Factory, the salt and pepper shakers are all ceramic replicas of the Great Pyramid at Giza. Each shaker has a square base 12 cm in length, and triangular faces each with a height of 12 cm. Farrow’s plans to paint the shakers. What is the surface area of each?



Solution

The model is a square pyramid. Each of the four triangular faces has the same area. To find its surface area, find the area of each face and of the base.

$$SA = 4(\text{area of triangular faces}) + \text{area of square base}$$

area of triangular face

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(12)(12)$$

$$A = 72$$

area of square base

$$A = s^2$$

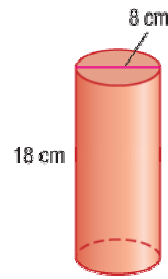
$$A = 12^2$$

$$A = 144$$

The surface area is 432 cm^2 .

Example 3

A can of soup is 18 cm high and 8 cm across.
What is the surface area of the can?

**Solution**

The can is a cylinder. To find its surface area, add the area of the curved surface to the area of the two bases. Use $\pi \approx 3.14$.

area of curved surface

$$A = 2\pi rh$$

$$A = (2)(\pi)(4)(18)$$

$$A \approx 452.16$$

area of each circular base

$$A = \pi r^2$$

$$A = (\pi)(16)$$

$$A \approx 50.24$$

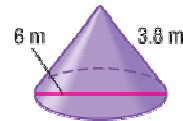
The can has two congruent circular bases. $(2)(50.24) \approx 100.48$.

$$SA \approx 452.16 + 100.48 \approx 552.64$$

The surface area of the can is approximately equal to 552.64 cm^2 .

Example 4

A tent in the shape of a teepee is 6 m across with a slant height of 3.8 m. What is the surface area of the canvas, including the floor?

**Solution**

The tent is a cone. To find its surface area, add the area of the curved surface to the area of the base.

$$SA = \pi rs + \pi r^2 \quad s = \text{slant height}$$

$$SA = \pi(3)(3.8) + \pi(3)^2$$

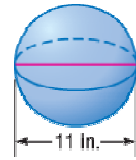
$$SA \approx 35.796 + 28.26$$

$$SA \approx 64$$

The surface area of the tent is approximately equal to 64 m^2 .

Example 5

SPORTS What is the surface area of a playground ball with a diameter of about 11 inches?

**Solution**

The playground ball is a sphere. To find its surface area, use the formula $SA = 4\pi r^2$.

$$SA \approx (4)(3.14)(5.5)^2$$

$$SA \approx 379.94$$

The playground ball has a surface area of about 380 in².