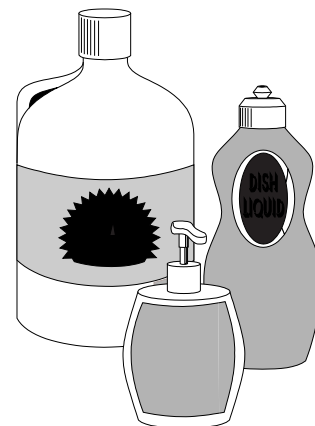


Real-Life Career Activity

Packaging Designer

Packaging designers create containers for consumer goods. Some factors the designer considers in creating the containers are: the type of product the container will hold, whether the product needs protection from sunlight or heat, and whether the container should be hard or soft. Packaging designers also consider how to label the container based on the type of product being packaged. For some products, the label should be colorful and appealing. For others, the label should be plain or contain a safety warning in large type that is easy to read.



The packaging designer must base the size of the label on the size of the container. The designer can use area formulas to calculate the surface area of the container.

Suppose the designer is making labels for cylindrical cans. The designer can use the formula below to calculate the area of the curved surface of the can. The labels will have the same area as the curved surface of the can and will not overlap at the seams. Most cans have no labeling at the top or bottom, so the designer will consider only the curved surface.

$$\text{area} = 2\pi rh$$

In this formula, r is the radius of the can, and h is the height of the can.

Suppose a designer must make a label for a can with radius 1.5 inches and height 5 inches. What is the area of the label rounded to the nearest whole number?

$$\begin{aligned} \text{area} &= 2 \times \pi \times 1.5 \times 5 \\ &= 2 \times \pi \times 1.5 \times 5 = 47.1238898 \end{aligned}$$

The label has an area of about 47 square inches.

Solve. Round to the nearest whole number.

1. Calculate the area of the label for a can with radius 4 inches and height 8 inches.
2. Calculate the area of the label for a barrel with radius 10 inches and height 36 inches.
3. Find the radius of the label for a drum with area 6,786 square inches and height 60 inches.