# Mid-Chapter Review

1. The world's largest raisin box was built by students in California. The box is a rectangular prism 12 ft high, 8 ft wide, and 4 ft deep. What is its surface area?
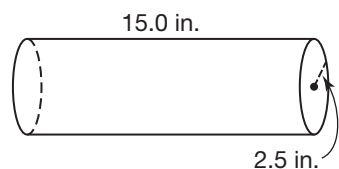
    e.g., SA = 2(12 ft × 4 ft) + 2(8 ft × 4 ft) + 2(12 ft × 8 ft)

    = 2(48 sq ft) + 2(32 sq ft) + 2(96 sq ft), or 352 sq ft

    The surface area of the giant raisin box is 352 sq ft.

2. These two steel rods are to be case-hardened. The process will cost more for the rod with greater surface area. Which rod will cost more to case-harden?

    15 in.

    4 in.
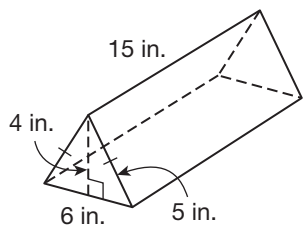
    6 in.   5 in.

    15.0 in.

    2.5 in.

    e.g., SA = 2(base area) + (lateral area)

    $= 2 \times \left[\frac{1}{2}(6 \text{ in.})(4 \text{ in.})\right] + (6 \text{ in.} + 5 \text{ in.} + 5 \text{ in.})(15 \text{ in.})$

    = 264 sq in.

    e.g., SA = 2(base area) + (lateral area)

    $= 2\pi(2.5 \text{ in.})^2 + 2\pi(2.5 \text{ in.})(15.0 \text{ in.})$

    = 274.889... sq in.

    The cylinder has more surface area. So it will cost more.

3. Tim works at a chocolate store. The store sells candy in two types of gift boxes. One is a square-based pyramid. The other is a cone. The one that uses less cardboard costs less to make. Both boxes have a slant height of 13.5 cm. Which box costs less to make?

    12 cm

    r = 6 cm
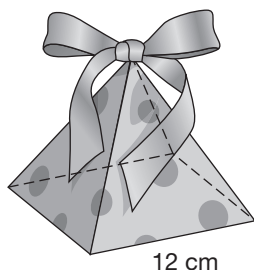
    e.g., SA = (12 cm)(12 cm)

    $+ 4 \times \left[\frac{1}{2}(12 \text{ cm})(13.5 \text{ cm})\right]$

    = 468 cm²

    $SA = \pi(6 \text{ cm})^2 + \pi(6 \text{ cm})(13.5 \text{ cm})$

    = 367.566... cm²

    The cone box has less surface area. So it costs less to make.