

### **MATC9 Ch3.5 Key Concepts 2 Minimizing the Surface Area of a Cylinder**

#### **Worked Example**

**Example:** A jumbo soda pop can was made to hold  $785 \text{ cm}^3$  of soda. The can was designed to minimize the surface area. Find the dimensions of the can.

**Solution:** In order to minimize surface area, the diameter of the can must equal the height. Use your calculator to try different heights, and adjust your estimates to find a radius of 5 cm and a height of 10 cm.

**Practice:**

1. Find the dimensions of a cylindrical fuel tank that holds 1000 L of fuel, and minimizes surface area.

2. Find the dimensions of a cylindrical oil can that holds  $240 \text{ cm}^3$  of oil, and minimizes surface area.

Answers: 1. radius 0.54 m and height 1.08 m   2. radius 3.37 cm and height 6.74 cm