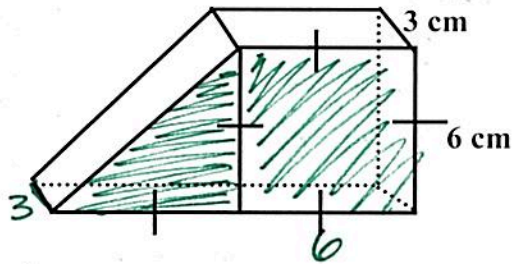


Leave your answers in terms of  $\pi$  and/or rounded to three decimal places.

1. Find the volume of the figure.

$$\begin{aligned} \Delta \text{ Prism} \\ V &= B \cdot h \\ &= \frac{6 \cdot 6}{2} \cdot 3 \\ &= 18 \cdot 3 \\ V &= 54 \end{aligned}$$

$$\begin{aligned} \square \text{ Prism} \\ V &= B \cdot h \\ &= (6 \cdot 6) \cdot 3 \\ &= 36 \cdot 3 \\ V &= 108 \end{aligned}$$

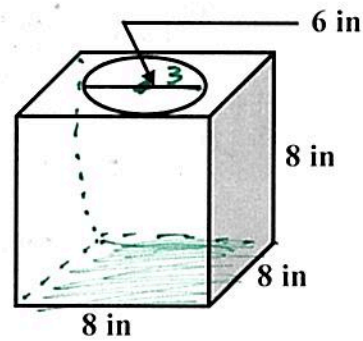


$$\text{Total} = 54 + 108 = \boxed{162 \text{ cm}^3}$$

2. Find the volume of the figure. The cylinder has been cut out.

$$\begin{aligned} V \text{ Prism} \\ V &= B \cdot h \\ &= (8 \cdot 8) \cdot 8 \\ V &= 512 \end{aligned}$$

$$\begin{aligned} V \text{ cylinder} \\ V &= \pi (3)^2 \cdot 8 \\ &= \pi (9) \cdot 8 \\ V &= 72\pi \end{aligned}$$



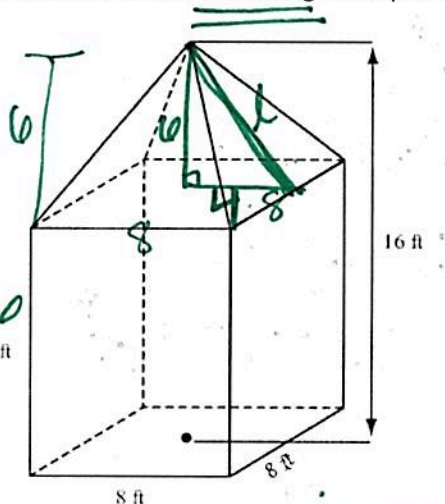
$$\text{Exact} \Rightarrow \boxed{V = 512 - 72\pi}$$

$$\text{Rounded} \Rightarrow \boxed{285.805}$$

3. The figure shown is a rectangular prism with a right square pyramid on top. Which of the following is the surface area of the entire solid excluding the square base?

$$\begin{aligned} \text{LA pyramid} &= \frac{1}{2} P l \\ &= \frac{1}{2} (32)(2\sqrt{13}) \\ &= 32\sqrt{13} \\ &\text{or } 115.376 \end{aligned}$$

$$\begin{aligned} \text{LA prism} &= P \cdot h \\ &= (32)(10) \\ &= 320 \end{aligned}$$



$$\begin{aligned} 6^2 + 4^2 &= l^2 \\ l &= \sqrt{52} \\ 2\sqrt{13} &\sim 7.211 \end{aligned}$$

$$\begin{aligned} \text{Total} &= 320 + 32\sqrt{13} \approx 435.378 \\ &\text{or } \boxed{435.376} \end{aligned}$$

4. Mrs. Mumford's lunch box is in the shape of a half cylinder on a rectangular prism.

a. Find the total volume

$$V_{\text{prism}} = B \cdot h$$

$$(6 \cdot 10) \cdot 8$$

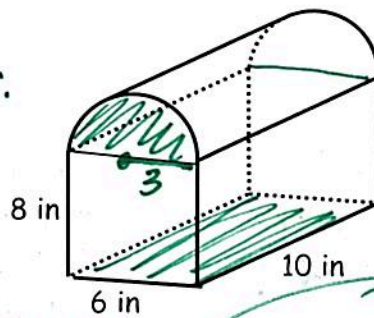
$$60 \cdot 8$$

$$V = 480$$

$$V_{\text{cylinder}/2} = \frac{\pi r^2 h}{2}$$

$$\frac{\pi (3)^2 \cdot 10}{2}$$

$$\frac{90\pi}{2} = 45\pi$$



$$\text{Total} = 480 + 45\pi \text{ in}^3$$

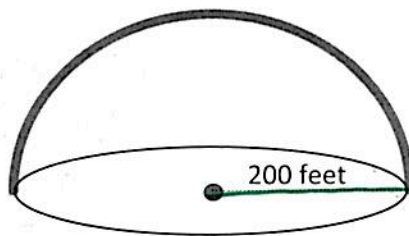
$$621.372 \text{ in}^3$$

5. Frisco wants to build another sports complex. The complex will include a turf field covered by a large dome in the shape of a hemisphere. How much material is needed to complete the dome?

$$SA = \frac{4\pi r^2}{2}$$

$$= 2\pi r^2$$

$$= 2\pi (200)^2$$



$$2\pi (40000)$$

$$80,000\pi \text{ ft}^2$$

$$251,327.412$$

6. The manager of Sunnybrooke Farm plans to buy a new grain silo. He needs to choose between two options. Silo A is a cylinder of height 25 feet and a radius of 8 feet. The roof is a hemisphere with the same radius. Silo B is a cylinder of height 20 feet and a radius of 10 feet. The roof is a hemisphere with the same radius.

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

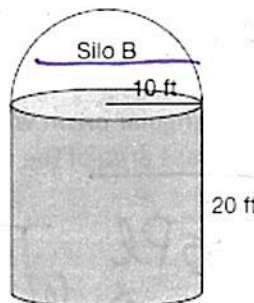
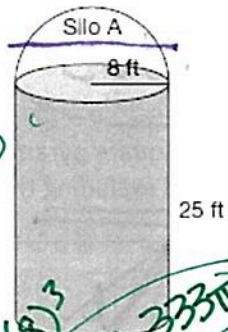
$$\pi (8)^2 \cdot 25$$

$$1600\pi$$

$$V = \frac{4}{3}\pi r^3$$

$$\frac{4}{3}\pi (8)^3$$

$$341.333\pi$$



$$V = \pi (10)^2 \cdot 20$$

$$2000\pi$$

$$V = \frac{2}{3}\pi (10)^3$$

$$666.667\pi$$

- a. Determine the volume of each silo.

$$1,941.333\pi$$

$$6,098.879 \text{ ft}^3$$

$$2,666.667\pi$$

$$8,377.580 \text{ ft}^3$$

- b. The farm manager will have to paint the outside of whichever silo he decides to purchase. Determine the surface area to be painted.

$$SA_{\text{hemisphere}} = 2\pi r^2$$

$$2\pi (8)^2 = 128\pi$$

$$LA = 2\pi r h$$

$$2\pi (8)(25) = 400\pi$$

$$528\pi$$

$$1,658.761$$

$$600\pi$$

$$1,984.956$$