

# Finding Height

$$\begin{aligned} \textcircled{1} \quad V &= \pi r^2 h \\ 18\pi &= \pi \cdot 3^2 \cdot h \\ \underline{18\pi} &= \underline{\pi \cdot 9 \cdot h} \\ \frac{18}{9} &= \frac{9h}{9} \\ \boxed{2_{\text{cm}} = h} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad V &= \frac{1}{3} \pi r^2 h \\ 2909.43 &= \frac{1}{3} \cdot \pi \cdot 21^2 \cdot h \\ \underline{2909.43} &= \underline{461.8141 h} \\ \frac{2909.43}{461.8141} &= \frac{461.8141 h}{461.8141} \\ \boxed{h \approx 6.3 \text{ mm}} \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad V &= \frac{1}{3} \pi r^2 h \\ 172.3 &= \frac{1}{3} \cdot \pi \cdot 8^2 \cdot h \\ \underline{172.3} &= \underline{67.0206 h} \\ \frac{172.3}{67.0206} &= \frac{67.0206 h}{67.0206} \end{aligned}$$

$$\begin{aligned} h &\approx 2.57 \\ \text{so } \boxed{h \approx 3 \text{ miles}} & \leftarrow \begin{array}{l} \text{Question says} \\ \text{to the nearest} \\ \text{whole mile} \end{array} \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad V &= \pi r^2 h \\ 791.7 &= \pi \cdot 6^2 \cdot h \\ \underline{791.7} &= \underline{113.0973 h} \\ \frac{791.7}{113.0973} &= \frac{113.0973 h}{113.0973} \\ h &\approx 7.000 \\ \boxed{h \approx 7 \text{ Km}} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad V &= \frac{1}{3} \pi r^2 h \\ 100\pi &= \frac{1}{3} \pi \cdot 5^2 \cdot h \\ \underline{100\pi} &= \underline{\frac{1}{3} \cdot \pi \cdot 25 \cdot h} \\ \frac{100}{25} &= \frac{\frac{1}{3} \cdot 25 \cdot h}{25} \\ 3 \cdot 4 &= \frac{1}{3} h \cdot 3 \\ \boxed{12 \text{ in} = h} \end{aligned}$$

You can do this in 1 step

$$\begin{aligned} \textcircled{4} \quad V &= \pi r^2 h \\ 826.79 &= \pi \cdot 5.5^2 \cdot h \\ \underline{826.79} &= \underline{95.0331 h} \\ \frac{826.79}{95.0331} &= \frac{95.0331 h}{95.0331} \\ \boxed{h \approx 8.7 \text{ cm}} \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad V &= \pi r^2 h \quad \star r=8 \\ 2,211.7 &= \pi \cdot 8^2 \cdot h \\ \underline{2,211.7} &= \underline{201.0619 h} \\ \frac{2,211.7}{201.0619} &= \frac{201.0619 h}{201.0619} \end{aligned}$$

$$h \approx 11.000$$

$$\boxed{h \approx 11 \text{ miles}}$$

$$\begin{aligned} \textcircled{8} \quad V &= \frac{1}{3} \pi r^2 h \\ 452.4 &= \frac{1}{3} \pi \cdot 6^2 \cdot h \\ \underline{452.4} &= \underline{37.6991 h} \\ \frac{452.4}{37.6991} &= \frac{37.6991 h}{37.6991} \end{aligned}$$

$$h \approx 12.000$$

$$\boxed{h \approx 12 \text{ feet}}$$