A rock is placed in a cylindrical container of water causing the water level to raise 5 cm. If the container has a diameter of 16 cm, what is the exact volume of the rock?

\[ V = 320\pi \text{ cm}^3 \]

What is the radius of a cylinder with a volume of \( 432\pi \text{ cm}^3 \) if its height is equal to twice its radius? (It will help to draw this out)

\[ r = 6 \text{ cm} \]

Find the height of a cone with a volume of \( 192\pi \text{ cm}^3 \) and a radius of 8.

\[ r = 9 \text{ units} \]

A hexagonal pyramid has a volume of 2598 cm\(^3\). The height of the pyramid is 30 cm. and the perimeter of the hexagon is 60. What is the length of the apothem? (Use an approximation, rounded to 2 decimal places)

\[ a = 8.66 \text{ cm} \]
Two solid cylinders are made of the same material. Cylinder A is six times as tall as cylinder B, but the diameter of cylinder B is four times the diameter of cylinder A. Which cylinder weighs more? How many times as much?

\[ \text{Cylinder B is } \frac{8}{3} \text{ times larger} \]

The "extra large" popcorn container is a right rectangular prism with dimensions 3 in. by 3 in. by 6 in. The "jumbo" is a cone with height 12 in. and diameter 8 in. The "colossal" is a right cylinder with diameter 10 in. and height 10 in. Find the volume of each. Approximately how many times as great is the "colossal" size compared to the "extra large"?

\[
\begin{align*}
\text{XL } V &= 54 \text{ in}^3 \\
\text{Jumbo } V &= 64\pi \approx 201.06 \text{ in}^3 \\
\text{Colossal } V &= 250\pi \approx 785.40 \text{ in}^3
\end{align*}
\]

Approximately 14.5 times larger.

Find SA and Volume

\[
\begin{align*}
\text{SA} &= 132 \text{ ft}^2 \\
V &= 76 \text{ ft}^3 \\
\text{SA} &= 7776 \text{ cm}^2 \\
V &= 34992 \text{ cm}^3 \\
\text{SA} &= 90\pi \text{ cm}^2 \\
V &= 100\pi \text{ cm}^3
\end{align*}
\]
A rock is placed in a cylindrical container of water causing the water level to raise 5 cm. If the container has a diameter of 16 cm, what is the exact volume of the rock?

\[ V = \left( \frac{8^2 \pi}{2} \right) \cdot 5 = 320 \pi \text{ cm}^3 \]

What is the radius of a cylinder with a volume of \(432\pi\) cm\(^3\) if its height is equal to twice its radius? (It will help to draw this out)

\[ V = (\pi r^2) \cdot h \]

\[ h = 2r \]

\[ \frac{132\pi}{2} = \pi r^2 \cdot 2r \]

\[ 216 \pi = r^3 \cdot r \]

\[ r = 6 \text{ cm} \]

Find the height of a cone with a volume of \(192\pi\) and a radius of 8.

\[ V \text{ of Cone} = \frac{1}{3} \pi r^2 h \]

\[ 192\pi = \frac{1}{3}\pi \left( 8^2 \right) h \]

\[ \frac{3}{64} \cdot 192 = \frac{64}{3} h \cdot \frac{64}{3} \]

\[ h = 9 \text{ cm} \]

A hexagonal pyramid has a volume of 2598 cm\(^3\). The height of the pyramid is 30 cm, and the perimeter of the hexagon is 60. What is the length of the apothem? (Use an approximation, rounded to 2 decimal places)

\[ V = \frac{1}{3} Bh \]

\[ V = \frac{1}{3} \left[ \frac{1}{2} aP \right] h \]

\[ 2598 = \frac{1}{3} \left[ \frac{1}{2} a \cdot 60 \right] \cdot 30 \]

\[ \frac{2598}{300} = \frac{300a}{300} \]

\[ a = 8.66 \text{ cm} \]
Two solid cylinders are made of the same material. Cylinder A is six times as tall as cylinder B, but the diameter of cylinder B is four times the diameter of cylinder A. Which cylinder weighs more? How many times as much?

\[ V = \frac{2}{3} \pi r^3 h \]

The "extra large" popcorn container is a right rectangular prism with dimensions 3 in. by 3 in. by 6 in. The "jumbo" is a cone with height 12 in. and diameter 8 in. The "colossal" is a right cylinder with diameter 10 in. and height 10 in. Find the volume of each. Approximately how many times as great is the "colossal" size compared to the "extra large"?

XL \( V \): \( 2 \times 3 \times 6 = 36 \text{ in}^3 \)

Jumbo \( V \): \( \frac{1}{3} (4^2 \pi)(12) = 64\pi \approx 201.06 \text{ in}^3 \)

Colossal \( V \): \( (5^2 \pi)(10) = 250\pi \approx 785.40 \text{ in}^3 \)

\[ \frac{785.40}{54} \approx 14.5 \text{ times larger} \]

Find SA and Volume

Total \( SA \): \( 152 \text{ ft}^2 \)

SA: Bottom - \( 2 \times 6 = 12 \)
Left - \( 2 \times 8 = 16 \)
Top - \( 2 \times 4 \times 2 \times 2 = 12 \)
Right - \( 3 \times 2 \times 2 \times 2 = 24 \)
Front/Back - \( 4 \times 8 + 2 \times 3 = 38 \)
Base - \( 2 \times 38 = 76 \)

SA: \( \pi \times 2 + \frac{1}{2} \times 2 \times 54 \times 54 \)

SA: \( \frac{1}{2} \times 54 \times 54 \times 36 \)

SA: \( \frac{1}{3} (34.5)(12) = 134.92 \text{ cm}^3 \)

\( \frac{25\pi + 65\pi}{} = 90\pi \text{ cm}^2 \)

\( V = \frac{1}{3} (34.5)(12) = 134.92 \text{ cm}^3 \)