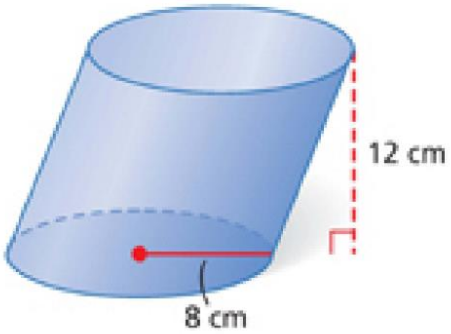
Goals for today

- Use equations for volume to solve problems
- Find the volume of composite figures

Find the volume of each cylinder. Give your answers both in terms of π and rounded to the nearest tenth.

A



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

$V_{cylinder} = \pi(8)^2 \cdot 12 = 768\pi \text{ cm}^3$

$\approx 2412.743 \text{ cm}^3$

B a cylinder with a base area of 36π in^2 and a height equal to twice the radius

$V = B \cdot h$

$\pi r^2 = 36\pi$

$r^2 = 36$

$r = 6$

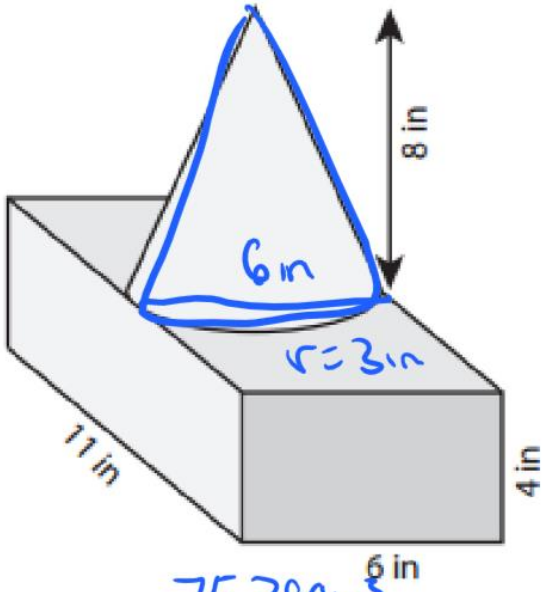
$h = 2 \cdot r$

$h = 2 \cdot 6$

$h = 12$

$V = 36\pi(12)$

$V = 432\pi \text{ cm}^3 = 1357.168 \text{ cm}^3$



$V_{cone} = \frac{1}{3}\pi r^2 \cdot h$

$V_{cone} = \frac{1}{3}\pi (3)^2 \cdot 8$

$= 24\pi = 75.398 in^3$

$V_{prism} = l \cdot w \cdot h$

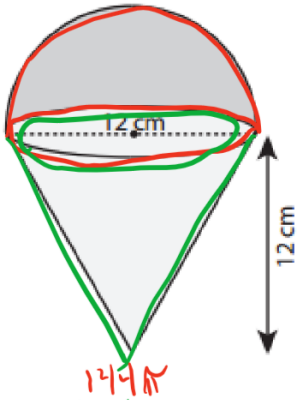
$V = 11 \cdot 6 \cdot 4$

$= 264 in^3$

75.398 in³

+ 264

Volume = 339.398 in³



$V_{sphere} = \frac{4}{3}\pi r^3$

$V_{sphere} = \frac{4}{3}\pi (6)^3$

$V_{sphere} = 288\pi \rightarrow V_{hemisphere} = \frac{288\pi}{2} = 144\pi \, cm^3$

$V_{cone} = \frac{1}{3}\pi r^2 \cdot h$

$V_{cone} = \frac{1}{3}\pi (6)^2 12$

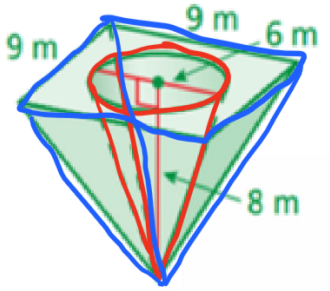
$V_{cone} = 144\pi$

144π

+ 144π

Volume = 288π cm³

Ex. 3 Find the volume left after removing the shown cone from the given pyramid.



$V_{pyramid} = \frac{1}{3} l \cdot w \cdot h$

$V_{pyramid} = \frac{1}{3} \cdot 9 \cdot 9 \cdot 8$

$V_{pyramid} = 216\ m^3$

$V_{cone} = \frac{1}{3} \pi r^2 \cdot h$

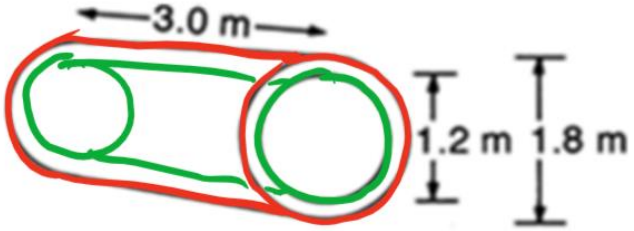
$V_{cone} = \frac{1}{3} \pi (3)^2 \cdot 8$

$V_{cone} = 24\pi \approx 75.398\ m^3$

$216 - 75.398$

$130.602\ m^3$

Ex. 4 A section of concrete pipe 30 m long has an inside diameter of 1.2 m and an outside diameter of 1.8 m. What is the volume of concrete in this section of pipe?



$V_{cylinder} = \pi (0.9)^2 \cdot 3$

$V_{cylinder} = 2.43\pi$

$V_{cylinder} = \pi (0.6)^2 \cdot 3$

$V_{cylinder} = 1.08\pi$

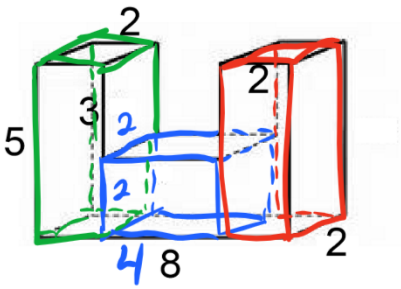
$V_{pipe} = 2.43\pi - 1.08\pi$

$V_{pipe} = 1.35\pi\ m^3 = 4.241\ m^3$

Recap:

How do you find the volume of a composite figure? Find the volume of each individual figure then combine them.

What would you do to find the volume of the following figure?



$V = 2 \cdot 2 \cdot 5 = 20$

$V = 4 \cdot 2 \cdot 2 = 16$

$V = 2 \cdot 2 \cdot 5 = 20$

$V = 20 + 20 + 16 = 56$