

Volume

Sphere

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

Pyramid

$$\frac{1}{3} \cdot B \cdot h$$

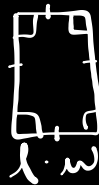
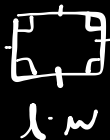
Cylinder

$$\pi r^2 \cdot h$$

Cone

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

area of
the base



$$r = 10$$

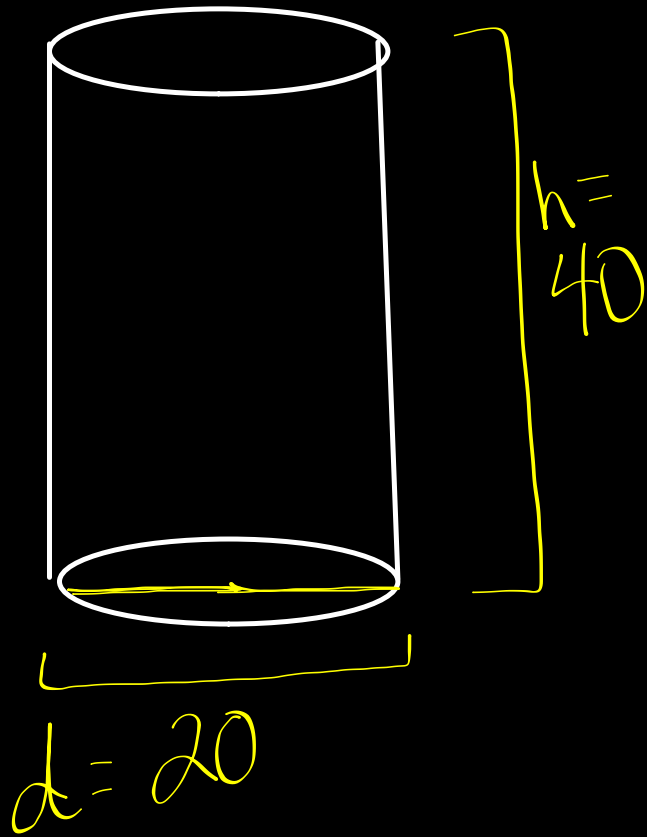
$$h = 40$$

$$\pi (10)^2 \cdot 40$$

$$\pi 100 \cdot 40$$

$$4000\pi$$

$$12,560$$



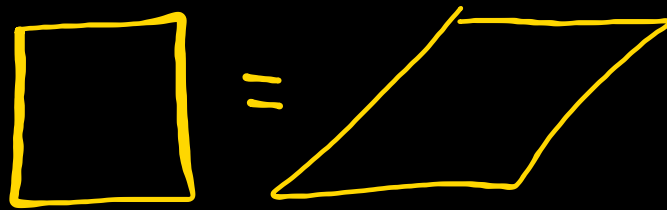
$\frac{4}{3} \pi r^3$
 $r = 7$

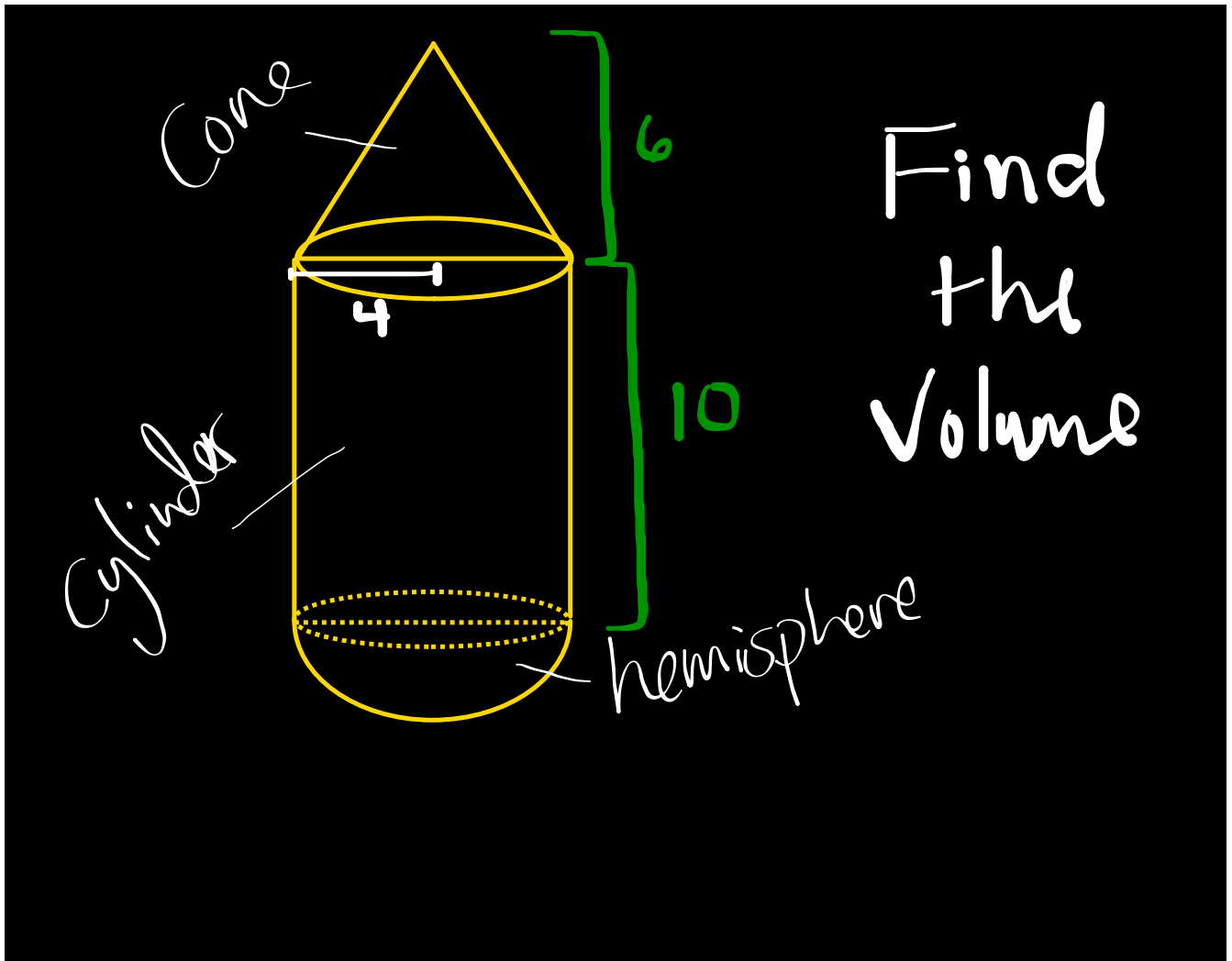
$\frac{4}{3} \pi (7)^3$
 $\frac{4}{3} \pi \cdot 343$
 457.33π
or
 $\frac{1372}{3} \pi$

$= 1436.75$

A diagram of a sphere is shown with a radius of 7. The sphere is drawn with a solid line for the top half and a dotted line for the bottom half. A horizontal line segment from the center to the right edge is labeled with the number 7.

Cavalieri's Principle





$$\text{Cone} = \frac{1}{3} \pi r^2 \cdot h$$

$$32\pi$$

$$100.53$$

$$+$$

$$160\pi$$

$$502.65$$

$$+$$

$$\frac{128}{3}\pi$$

$$134.04$$

$$\approx 737.22$$

$$\text{Cyl} = \pi r^2 \cdot h$$

$$\text{Mini Sphere} = \frac{4}{3} \pi r^3$$

$$x \cdot x \cdot x$$

$$x^3$$

$$x + x + x$$

$$3x$$

How much water?

$\frac{4}{3} \pi (12)^3$
7238.23

$\frac{1}{3} \pi (12)^2 \cdot (12)$
1809.46

12

12 cm

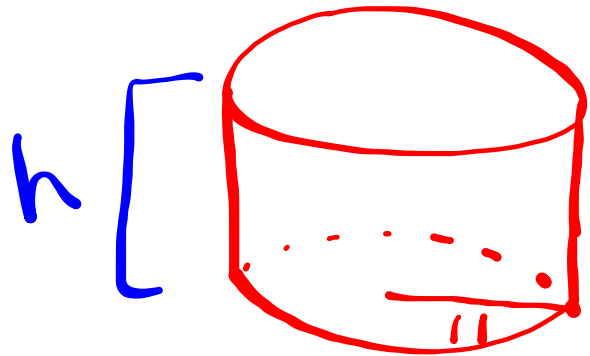
5428.67

The diagram shows a sphere with a radius of 12 cm. A yellow spherical cap is shown at the top, with a height of 12 cm. The radius of the cap's base is 12 cm. The volume of the sphere is calculated as $\frac{4}{3} \pi (12)^3 = 7238.23$. The volume of the cap is calculated as $\frac{1}{3} \pi (12)^2 \cdot (12) = 1809.46$. The volume of water is the difference: $7238.23 - 1809.46 = 5428.67$.

5.

$$r = 11$$

$$V = 1089\pi$$



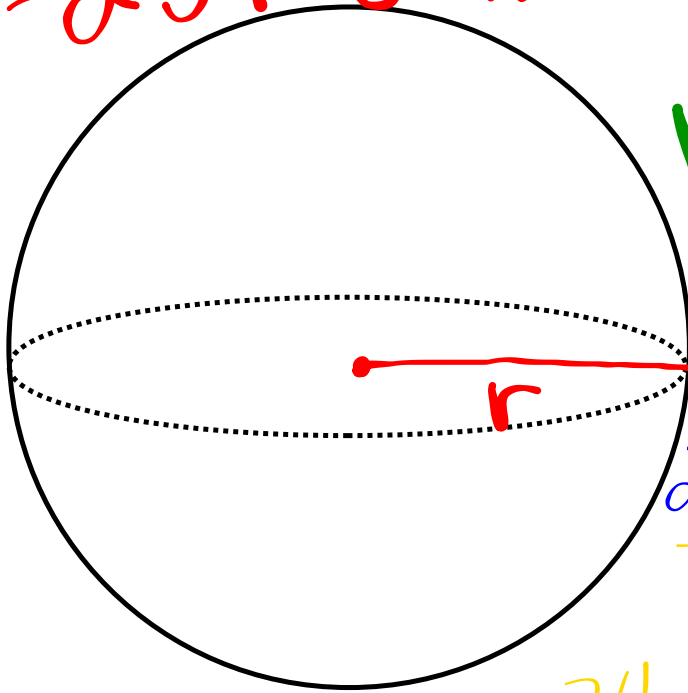
$$V = \pi r^2 \cdot h$$

$$\frac{1089\pi}{121\pi} = \frac{\pi(11)^2 \cdot h}{121\pi}$$

$$\frac{1089}{121} = h$$

$$h = 9$$

$$V = 234.8 \text{ in}^3$$



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

$$\frac{234.8}{\pi} = \frac{4}{3} \pi r^3$$

$$\frac{3}{4} \cdot 74.73 = \frac{4}{3} r^3$$

$$56.05 = r^3$$

$$r = \textcircled{3.83}$$