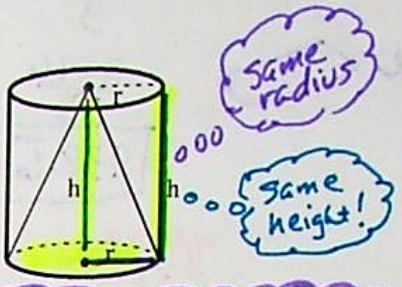
Volume of Cones

NOTES: To find the volume of a cone, substitute the measurements given for the cone into the correct formula and solve. Remember, volumes are expressed using cubic units, such as $in^3, ft^3, m^3, cm^3, or\ units^3$.

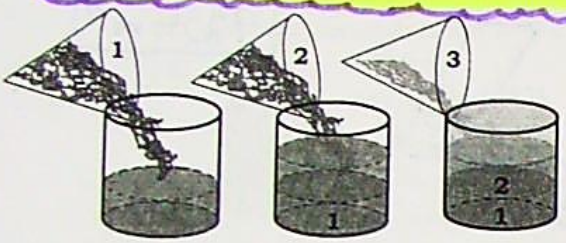
Volume of a CONE $V_{cylinder} = \pi r^2 h$

cone: take one-third!

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



In words: The volume of a cone equals one-third the volume of a cylinder with the same radius and height!



In a drawing of a cone inside a cylinder, you might see that that the triangular cross-section of a cone is $\frac{1}{2}$ the rectangular cross-section of the cylinder.

That is seeing the situation in only two dimensions.

Why do you suppose the **volume** (which is in three dimensions) turns out to be *less* than $\frac{1}{2}$ the volume of the cylinder? It actually turns out to be $\frac{1}{3}$!

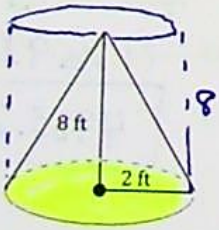
NOTES

Do this...

Volume of Cone Formula: $V = \frac{1}{3}Bh \rightarrow$ or $\frac{Bh}{3}$, so $\frac{\pi r^2 h}{3}$

Find the volume of the following cones. Leave answers in terms of π, then approximate to the nearest tenth using 3.14 for π.

1) $r = 2$, $h = 8$



$V = \frac{\pi(2)^2 8}{3}$

$\frac{\pi(4)(8)}{3}$ | $\approx 33.5\ ft^3$

$\frac{32\pi}{3} = 10.\overline{6}\pi\ ft^3$

2) $r = 8$, $h = 9$

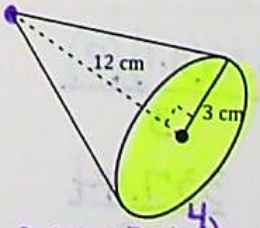
$\frac{\pi(8)^2(9)^3}{3}$

$\pi(64)(3)$

$= 192\pi\ in^3$

$\approx 602.9\ in^3$

3)



$r = 3$, $h = 12$

$\frac{\pi(3)^2(12)^4}{3}$

$\pi(9)(4)$

$V = 36\pi\ cm^3$ | $\approx 113.0\ cm^3$