

Geometry 1 - BE | Monday

4-2-12

- ① Tank A level is dropping $\frac{1}{2}$ inches every 4 hours while Tank B is dropping $\frac{1}{8}$ inches every 6 hours. Tank A started at 96 inches, Tank B at 78 inches. When will the Tank levels be equal?
- ② Adam can do a job in 5 hours. Jennifer can do the same job in 6 hours. If they work together, how long will the job take?
-

$$\textcircled{1} \quad \text{TANK A} \Rightarrow -\frac{1}{2} \text{ in}/(4 \text{ hrs}) \Rightarrow -\frac{1}{8} \text{ in per hr}$$

$$\text{TANK B} \Rightarrow -\frac{1}{8} \text{ in}/(6 \text{ hrs}) \Rightarrow -\frac{1}{48} \text{ in per hr}$$

$$L_A = -\frac{1}{8} \frac{\text{in}}{\text{hr}} (h) \text{ hr} + 96 \text{ in}$$

$$L_B = -\frac{1}{48} \frac{\text{in}}{\text{hr}} (h) \text{ hr} + 78 \text{ in}$$

$$\begin{array}{rcl} -\frac{1}{8} h + 96 & = & -\frac{1}{48} h + 78 \\ + \frac{6}{48} h - 78 & & + \frac{6}{48} h - 78 \end{array}$$

$$18 = \frac{5}{48} h$$

$$\frac{18 \cdot 48}{5} = h$$

$$\therefore \boxed{h = 172.8 \text{ hrs}}$$

$$\textcircled{2} \quad \text{Adam} \Rightarrow 1 \text{ job per } 5 \text{ hrs} \Rightarrow \frac{1}{5} \frac{\text{jobs}}{\text{hr}}$$

$$\text{Jen} \Rightarrow 1 \text{ job per } 6 \text{ hrs} \Rightarrow \frac{1}{6} \frac{\text{jobs}}{\text{hr}}$$

$$J_{\text{Adam}} = \frac{1}{5} \frac{\text{jobs}}{\text{hr}} (h) + 0$$

$$J_{\text{Jen}} = \frac{1}{6} \frac{\text{jobs}}{\text{hr}} (h) + 0$$

$$J_{\text{together}} = \left(\frac{1}{5} + \frac{1}{6} \right) h \quad \text{for } J_T = 1$$

$$1 = \left(\frac{6}{30} + \frac{5}{30} \right) h$$

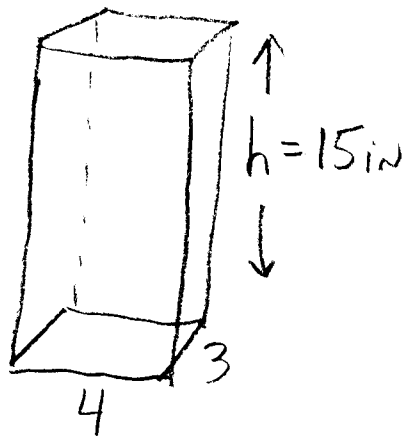
$$1 = \frac{11}{30} h \quad \therefore \boxed{h = \frac{30}{11} = 2 \frac{8}{11} \text{ hrs}}$$

Ch. 13-1 Volume of Prisms and Cylinders

VOLUME A measure of how much SPACE a figure encloses.
Measured in cubic units.

General method $\Rightarrow$ find the area of a base and multiply the base area by the height.

(EX) Rectangular Prism
base is 3 in $\times$ 4 in

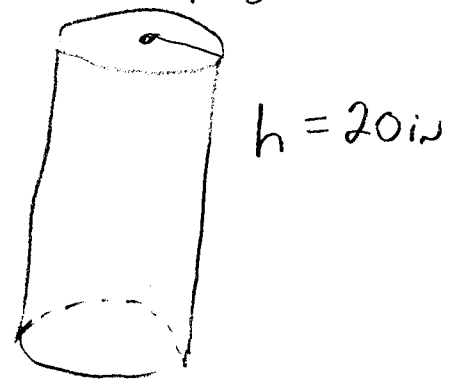


$$V = \underbrace{(3)(4)}_{\text{Area of base}} \cdot (15)$$

$$V = 12 \cdot 15$$

$$V = 180 \text{ in}^3$$

(EX) CYLINDER
base radius is 5 in.
 $r = 5$



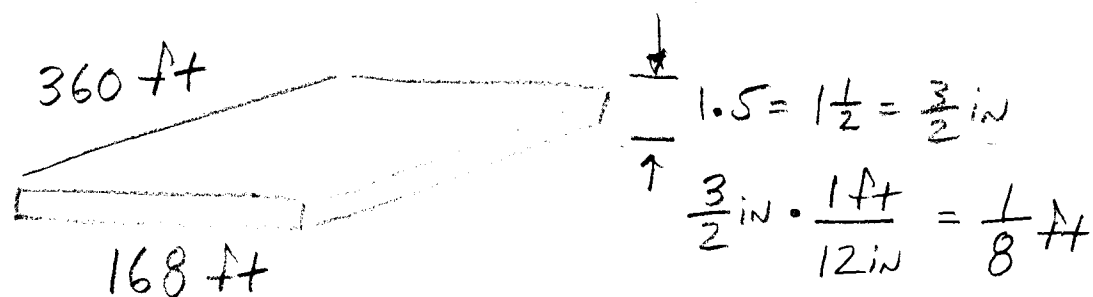
$$V = \underbrace{\pi(5)^2}_{\text{Area of base}} \cdot 20$$

$$V = 25\pi \cdot 20$$

$$V = 500\pi \text{ in}^3 \text{ EXACT}$$

$$V \approx 1570.8 \text{ in}^3 \text{ APPROXIMATE}$$

EX Find the volume (ft^3) of topsoil needed to raise a $120 \text{ yd} \times 56 \text{ yd}$ football field by 1.5 inches.



$$V = (\text{Area of base})(\text{height})$$

$$V = (360 \cdot 168) \frac{1}{8}$$

$$V = 45 \cdot 168$$

$$V = 7560 \text{ ft}^3$$

$$\begin{array}{r} 168 \\ 45 \\ \hline 840 \\ 672 \\ \hline 7560 \end{array}$$

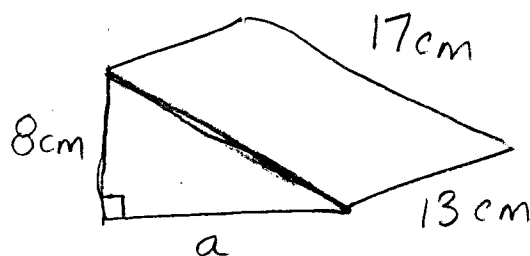
How many yd^3 in this

$$\begin{array}{c} \text{1 yd}^3 \\ \text{1 yd} \times \text{1 yd} \times \text{1 yd} \end{array} = \begin{array}{c} \text{3 ft} \times \text{3 ft} \times \text{3 ft} \\ \text{3 ft} \times \text{3 ft} \times \text{3 ft} \end{array} = 27 \text{ ft}^3$$

$$V = \frac{7560}{27} = \frac{840}{3} = 280 \text{ yd}^3$$

or 56,550 gallons.

Ex 1
Pg 689 Find Volume of triangular prism



$$a^2 = 17^2 - 8^2 = 289 - 64 = 225$$

$$a = 15 \text{ cm}$$

$$V = (\text{area of base})(h)$$

$$V = \frac{1}{2}(15)(8) \cdot 13$$

$$V = 60 \cdot 13 = \boxed{780 \text{ cm}^3}$$

If 2 solids have same height and same "cross-sectional" area at every "level", they have the same volume.

(Ex) see STACK OF COINS, Pg 690

Homework: Pg 691 # 1-6

💡 Try entering "volume 360 ft, 168 ft, 0.125 ft" INTO Wolfram Alpha.