Geometry 1-BE Monday 3-21-11

(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?

(1) Tank A $\Rightarrow -\frac{1}{2}$ in / (4 hrs) $\Rightarrow -\frac{1}{8}$ in per hr.

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

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

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

$$-\frac{1}{8}h + 96 = -\frac{1}{48}h + 78$$

$$+\frac{6}{48}h \quad -78 \qquad +\frac{6}{48}h \quad -78$$

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

$$\frac{18 \cdot 48}{5} = h \quad \therefore \boxed{h = 172.8\,hrs}$$

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(2) Adam $\Rightarrow$ 1 job per 5 hrs $\Rightarrow \frac{1}{5}\frac{jobs}{hr}$

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

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

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

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

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

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

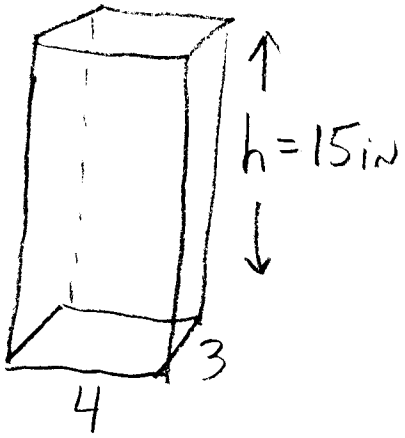
Ch. 13-1 Volume of Prisms and Cylinders

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

General method ⇒ find the area of a base and multiply the base area by the height.

(Ex) Rectangular Prism

base is 3in × 4in



$V = (3)(4) \cdot (15)$

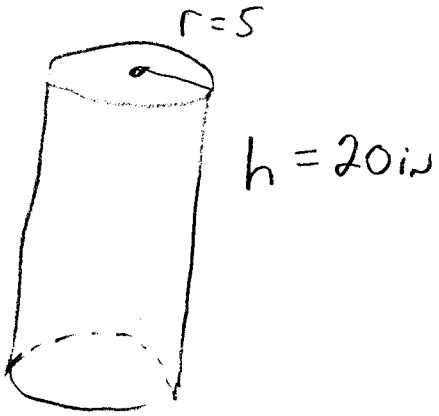
Area of base

$V = 12 \cdot 15$

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

(Ex) Cylinder

base radius is 5in.



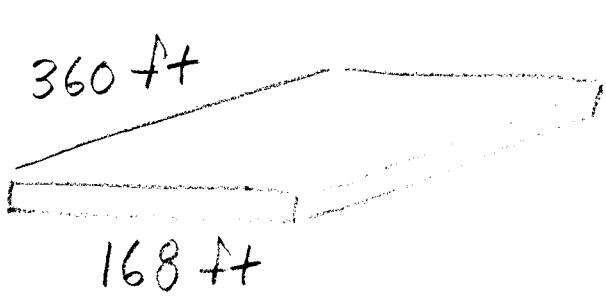
$V = \underbrace{\pi(5)^2}_{\text{Area of base}} \cdot 20$

$V = 25\pi \cdot 20$

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

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

(EX) Find the volume (ft^3) of topsoil needed to raise a 120 yd × 56 yd football field by 1.5 inches.



$1.5 = 1\frac{1}{2} = \frac{3}{2}$ in

$\frac{3}{2}\text{in} \cdot \frac{1\text{ft}}{12\text{in}} = \frac{1}{8}\text{ft}$

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

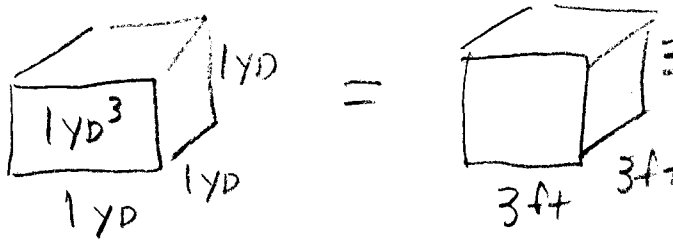
$V = (360 \cdot 168)\frac{1}{8}$

$V = 45 \cdot 168$

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

168
45
840
672
7560

How many yd^3 in this

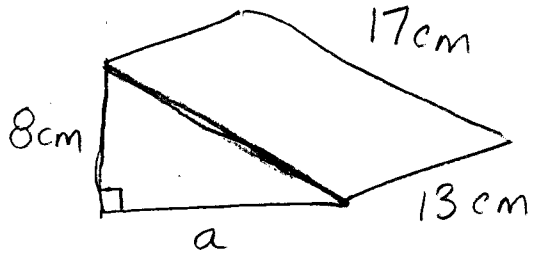


$= 27\ ft^3$

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

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 WolframAlpha.