BE-Algebra I | Monday 9-27-10

① $V = \pi r^2 h$ for h

② $r = 12$ ft, $V = 1810$ ft^3 (cubic feet). Find h from answer to ①. $\pi \approx 3.14$ (to nearest integer) (nearest ft)

* RETURN GRADED QUIZ [illegible] HW 6

① $\dfrac{V}{\pi r^2} = \dfrac{\pi r^2 h}{\pi r^2}$ $\therefore$ $\boxed{h = \dfrac{V}{\pi r^2}}$

② $r = 12$ $V = 1810$ $h = \dfrac{(1810)}{(3.14)(12)^2}$

$h = \dfrac{\cancel{1810}^{905}}{(3.14)(\cancel{144})_{72}}$

$h = \dfrac{905}{226}$

$\boxed{h \approx 4 \text{ ft}}$

UNITS

$\dfrac{\text{ft}^3}{\text{ft}^2}$

$\dfrac{\text{ft}\cdot\text{ft}\cdot\text{ft}}{\text{ft}\cdot\text{ft}}$

ft

"Side calculations"

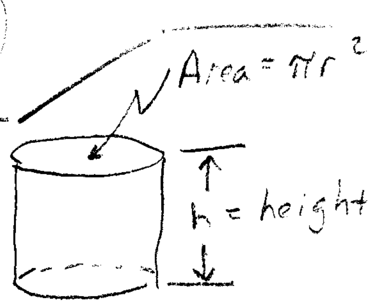
$$\begin{array}{r} 3.14 \\ \times\ 72 \\ \hline 628 \\ 2198\ \\ \hline 226.08 \end{array}$$

$$226 \overline{)905.00} = 004.00$$
$$\begin{array}{r} 904 \\ \hline 100 \end{array}$$

Formula for Volume of a cylinder

$V = (\text{area of base})(\text{height})$
$\quad\;\; (\pi r^2) \quad (h)$

$\text{ft}^3 = (\text{ft}^2)(\text{ft})$



(*d) RATIO A COMPARISON OF TWO NUMBERS BY DIVISION (ANOTHER NAME FOR A FRACTION)

(*d) PROPORTION AN EQUATION THAT HAS TWO RATIOS EQUAL TO EACH OTHER.

EX) $\frac{3}{4} = \frac{6}{8}$ OR $\frac{5}{6} = \frac{3}{y}$

PROPORTIONS HAVE THEIR OWN WAY OF BEING READ: $\frac{3}{4} = \frac{6}{8}$

READ AS: 3 IS TO 4 AS 6 IS TO 8

$3 \div 4 = 6 \div 8$

LETS LOOK AT A PROPERTY OF EVERY PROPORTION THAT OFTEN SAVES A STEP WHEN SOLVING THESE SPECIAL TYPES OF EQUATIONS

Let: a, b, c, d be any integers

Let: $\frac{a}{b} = \frac{c}{d}$ be any proportion

Multiply both sides by b

$$b \cdot \frac{a}{b} = \frac{c}{d} \cdot b$$

$$a = \frac{bc}{c}$$

{NOTE: $cb = bc$ ↑ Alphabetical is preferred

Now, multiply both sides by d

$$d \cdot a = \frac{bc}{d} \cdot d$$

$$ad = bc \quad \text{for any} \quad \frac{a}{b} = \frac{c}{d}$$

$\Rightarrow$ "The cross-products of a proportion are EQUAL"

$$\frac{a}{b} = \frac{c}{d} \quad \therefore \quad ad = bc$$

(EX) $\frac{x}{5} = \frac{3}{9}$ $\therefore$ $9x = 15$ using cross-products

$$x = \frac{15}{9} = \frac{5}{3}$$

OR $5 \cdot \frac{x}{5} = \frac{3}{9} \cdot 5$ Using "undos"

$$x = \frac{15}{9} = \frac{5}{3}$$

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*(EX) 3 Pg 156 SOLVE $\frac{N}{15} = \frac{24}{16}$

$16N = 15 \cdot 24$

TIP: WAIT TO MULTIPLY 15·24, you may be able to simplify first

$N = \frac{15 \cdot 24^{3}}{16_{2}}$

YOU ARE!! ÷ by 8

$N = \frac{45}{2}$

Very common proportions ⇒

- MAPS
- SCALE MODELS
- RATES ⇒ A measure WITH 2 different units IN A RATIO: $\frac{mi}{hr}$, $\frac{°F}{day}$, $\frac{STUDENTS}{CLASS}$

(*d)

Ex 4 Pg 157 Trent, 30 mi bike ride each Saturday
Rides 30 mi in 4 hrs.
How far in 6 hrs. at this rate?

30 mi is to 4 hrs
as
x mi is to 6 hrs

miles → hours →

$$\frac{30}{4} = \frac{x}{6}$$ ← miles ← hours

$$\frac{4x}{4} = \frac{6 \cdot 30}{4}$$

$$\boxed{x = \frac{90}{2} = 45 \text{ miles in 6 hrs}}$$

Ex 5 Pg 157 Map: 2 inches = 9 miles
distance on map is $1\frac{3}{4} = \frac{7}{4}$ inches.
How many miles?

Decide: $\frac{\text{real}}{\text{map}}$ or $\frac{\text{map}}{\text{real}}$? $\Rightarrow \frac{mi}{in}$ or $\frac{in}{mi}$

2 inches is to 9 mi as $\frac{7}{4}$ inches is to x mi

→ Map (in)
→ Real (mi)

$$\frac{2}{9} = \frac{\frac{7}{4}}{x} \quad \therefore \quad 2x = 9 \cdot \frac{7}{4} = \frac{63}{4}$$

$$x = \frac{63}{4} \cdot \frac{1}{2}$$

$$\boxed{x = \frac{63}{8} = 7\frac{7}{8} \text{ miles}}$$

From ACT Practice Test:

41 Amy can run 3 miles in s minutes. At that pace, how many miles can she run in 50 minutes?

A. $\frac{3s}{50}$

B. $\frac{50s}{3}$

C. $50\frac{(s)}{3}$

D. $3(50s)$

E. $\frac{150}{s}$

ANS.

$$\frac{3 \text{ miles}}{5 \text{ min.}} = \frac{x \text{ mi}}{50 \text{ min.}}$$

$$\frac{5x}{5} = \frac{3 \cdot 50}{5}$$

$$x = \frac{150}{5}$$

To trick you, the ACT will MIX UNITS, IN THIS EXAMPLE ⇒ NO TRICKS. BUT WATCH, they may have similar problem with ... 50 hours!

Homework: Pg. 158-159 # 19-24, 31-35