

BE-Algebra I | MONDAY 9-22-08

① $V = \pi r^2 h$ for h

② $r = 12$ $V = 1810$ find h from answer to ①. $\pi \approx 3.14$
(to nearest integer)

* RETURN GRADED QUIZ 5 AND HW 6

① $\frac{V}{\pi r^2} = \frac{\pi r^2 h}{\pi r^2}$

$\therefore h = \frac{V}{\pi r^2}$

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

$h = \frac{905}{(3.14)(144)}$

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

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

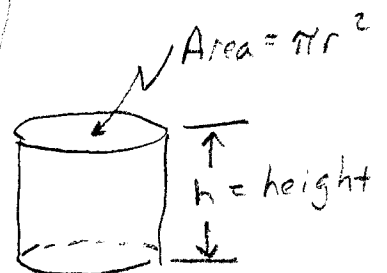
$h = \frac{905}{226}$

$h \approx 4$

Formula for Volume of a cylinder

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

$ft^3 = (ft^2)(ft)$



(*)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.

$$\text{EX) } \frac{3}{4} = \frac{6}{8} \quad \text{OR} \quad \frac{5}{X} = \frac{3}{Y}$$

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

$$3 \div 4 = 6 \div 8$$

LET'S 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

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

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

Now, multiply both sides by d

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

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

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

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

Notes: $cb = bc$
 $\uparrow$
 Alphabetical
 is preferred

(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"

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

* (EX) 3 Pg 156
SOLVE

$$\frac{N}{15} = \frac{24}{16}$$

$$16N = 15 \cdot 24$$

$$N = \frac{15 \cdot 24}{16}$$

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

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

YOU ARE !!!
(÷ by 8)

Very common proportions $\Rightarrow$

- MAPS
- SCALE MODELS

(*) d

- RATES $\Rightarrow$ A measure with 2 different units
in a ratio: $\frac{\text{mi}}{\text{hr}}$, $\frac{\text{of}}{\text{day}}$, $\frac{\text{STUDENTS}}{\text{CLASS}}$

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

$$\begin{array}{l} \text{MILES} \rightarrow \frac{30}{4} = \frac{X}{6} \leftarrow \text{miles} \\ \text{hours} \rightarrow \end{array}$$

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

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

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

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

$$\begin{array}{l} \rightarrow \text{MAP (in)} \\ \rightarrow \text{REAL (mi)} \end{array} \quad \frac{2}{9} = \frac{\frac{7}{4}}{X} \quad \therefore 2X = 9 \cdot \frac{7}{4} = \frac{63}{4}$$

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

$$X = \frac{63}{8} = 7\frac{7}{8} \text{ miles}$$

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.

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

$$\frac{sx}{s} = \frac{3 \cdot 50}{s}$$

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



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

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