8.1: Ratios & Proportions

Note Title 1/15/2016

RATIO: QUOTIENT OF 2 INTEGERS

PROPORTION:

$$\frac{1}{2} = \frac{3}{6} \Rightarrow \frac{\cancel{2}}{\cancel{3}}\frac{1}{\cancel{2}} = \frac{\cancel{3}}{6}\frac{2}{\cancel{3}} \rightarrow \frac{1}{3} = \frac{2}{6}$$

$$\frac{2}{6} = \frac{1}{3}$$

Means. Extremes Product
(cross-multiply)

$$\frac{2}{1} = \frac{6}{3}$$

Arithmetic Mean 1st test 80
2nd 100

arith. mean $= \frac{80+100}{2}$ or 90

arith mean $= \frac{3+12}{2} = 15/2$

Geometric Mean betw 3 & 12

$$\frac{3}{x} = \frac{x}{12} \rightarrow x^2 = 36 \rightarrow x = 6$$

aka mean proportional betw 3 & 13

$$\frac{3}{x} = \frac{x}{13} \rightarrow x^2 = 39 \rightarrow x = \pm\sqrt{39}$$

find geo mean betw 80 & 100

$$\frac{80}{x} = \frac{x}{100} \rightarrow x^2 = 80 \cdot 100$$

8000

$80 \cdot 100$

4 20 10 10

4 5

$$x = \sqrt[2]{80 \cdot 100}$$

$$x = \sqrt[2]{4 \cdot 4 \cdot 5 \cdot 10 \cdot 10}$$

$$x = 4 \cdot 10\sqrt{5}$$

$$x = 40\sqrt{5}$$

Solve for x

$$\frac{7}{x-4} = \frac{3}{5} \quad (x-4)(5)$$

$$\Rightarrow 35 = 3(x-4)$$

$$35 = 3x - 12$$

$$47 = 3x$$

$$\frac{47}{3} = x$$

Find the 4th proportional

Ex1 $1, 9, 11$

$$\frac{1}{9} = \frac{11}{x} \qquad x = 99$$

extremes

$1, 9, 11, 99$

means

extremes

$1 = 11$

$9 = 99$

means

Ex2 $a, b, 5$

$$\frac{a}{b} = \frac{5}{x} \rightarrow ax = 5b \rightarrow x = \frac{5b}{a}$$

$$\frac{M}{A} = \frac{I}{H}$$

3rd prop is "T"

Find ratio x to y → top → numerator

$$\frac{x}{y} =$$

Ex3 $3x = 4y$

$$\frac{3x}{3y} = \frac{4y}{3y} \rightarrow \boxed{\frac{x}{y} = \frac{4}{3}}$$

Ex 4 $\frac{6y}{20y} = \frac{20x}{20y} \rightarrow \frac{6}{20} = \frac{x}{y} \rightarrow \frac{3}{10} = \frac{x}{y}$

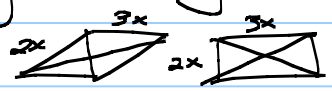
Ex 5 $\frac{1}{\left(x + \frac{7}{3}\right)} = \frac{3}{y+7}$

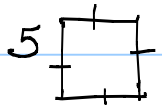
$y + 7 = 3\left(x + \frac{7}{3}\right)$

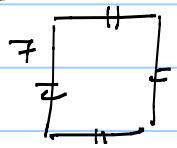
$y + 7 = 3x + 7$

$\frac{y}{3y} = \frac{3x}{3y} \rightarrow \frac{1}{3} = \frac{x}{y}$

What's name of quad sides 2:3 diags 1:1 } Rectangle







P: 20 28 Ratio P: $\left(\frac{5}{7}\right)^1 = 5/7$

A: → 2dim 25 49 Ratio A: $\left(\frac{5}{7}\right)^2 = \frac{25}{49}$

V: 3dim Ratio Vol: $\left(\frac{5}{7}\right)^3$