

Name: _____

Date: _____

Hour: _____

KEY

Ratio and Proportion Review/Intro

When you say "I got 21 out of 24 questions correct on the last quiz," you are comparing two numbers. The *ratio* of your correct questions to the total number of questions is 21 to 24. You can write the ratio as 21:24, as a fraction ($\frac{21}{24}$), or as a decimal (0.875).

↳ SIMPLIFY $\frac{7}{8}$

1. Use the information below about students in one of Mrs. Pearl's classes

	Eye Color			
	Brown eyes	Blue Eyes	Hazel Eyes	Total:
Males	9	3	2	14
Females	11	4	1	16
Total:	20	7	3	30

Write these ratios as fractions.

- a.) Males with brown eyes to males. $\frac{9}{14}$
- b.) Females with brown eyes to students with brown eyes. $\frac{11}{20}$
- c.) Females with blue eyes to males with blue eyes. $\frac{4}{3}$
- d.) All students with hazel eyes to all students. $\frac{3}{30} = \frac{1}{10}$

A *proportion* is an equation stating that two ratios are equal. For example, $\frac{2}{3} = \frac{8}{12}$ is a proportion.

One way to check that a proportion is true is by finding the decimal equivalents of each side.

$$\frac{2}{3} = \frac{8}{12} \Rightarrow .\bar{6} = .\bar{6}$$

but...

$$\frac{3}{8} \neq \frac{2}{12} \Rightarrow 0.375 \neq .\bar{16}$$

★ CHECK BY

CROSS

MULTIPLYING★

$$\Rightarrow 3 \cdot 12 = 2 \cdot 8$$

$$36 \neq 16$$

by cross multiplying
Solve each equation. Make sure to show your work!

$$1. \frac{21}{35} = \frac{x}{20}$$

$$35 \cdot x = 21 \cdot 20$$

$$35x = 420$$

$$\boxed{x = 12}$$

$$2. \frac{x}{25} = \frac{(2x+4)}{70}$$

$$25(2x+4) = 70 \cdot x$$

$$50x + 100 = 70x$$

$$100 = 20x$$

$$\boxed{5 = x}$$

$$3. \frac{x}{30} = \frac{30}{200}$$

$$200x = 30 \cdot 30$$

$$200x = 900$$

$$\boxed{x = \frac{9}{2}}$$

or 4.5

$$4. \frac{(x+8)}{8} = \frac{6}{7}$$

$$7(x+8) = 8 \cdot 6$$

$$7x + 56 = 48$$

$$7x = -8$$

$$\boxed{x = -8/7}$$

$\approx -1.142857\dots$

$$5. \frac{(y+5)}{5} = \frac{6}{(y-2)}$$

$$(y+5)(y-2) = 6 \cdot 5 \quad \text{*FOIL*}$$

$$y^2 - 2y + 5y - 10 = 30$$

$$y^2 + 3y - 10 = 30 \quad \text{*set=0*}$$

$$y^2 + 3y - 40 = 0 \quad \text{*FACTOR*}$$

$$\begin{array}{r} 4 \ 10 \\ 2 \ 20 \\ \hline 5 \ 8 \end{array} \Rightarrow -5, 8$$

$$(y-5)(y+8) = 0$$

$$\downarrow$$

$$y-5=0$$

$$\boxed{y=5}$$

$$\downarrow$$

$$y+8=0$$

$$\boxed{y=-8}$$

ZIPP

$$6. \frac{(n+4)}{3} = \frac{-3}{(n-2)}$$

$$(n+4)(n-2) = 3(-3)$$

$$n^2 - 2n + 4n - 8 = -9$$

$$n^2 + 2n - 8 = -9$$

$$n^2 + 2n + 1 = 0$$

$\uparrow \uparrow$

$$(n+1)(n+1) = 0$$

$$\downarrow$$

$$n+1=0$$

$$\boxed{n=-1}$$

$$\downarrow$$

$$n+1=0$$

$$\boxed{n=-1}$$