

BE-1A MONDAY 10-25-10

Simplify:

① $\frac{12}{15}$

② $\frac{28}{49}$

③ $\frac{108}{9}$

④ $2(x+6)$

⑤ $5x - 2(3x - 4) + 6x - 2$

RATIO

A fraction, two numbers that are being divided.

(EX) $\frac{1}{7}$ is "one divided by seven"
or "the ratio of 1 to 7"

RATE

A ratio, or fraction, where the two numbers have different units

(EX) $\frac{6 \text{ miles}}{\text{hour}}$ or $\frac{6 \text{ miles}}{1 \text{ hour}}$

READ "miles per hour"

$\downarrow$
means $\div$ by hours

THERE is a simple type of EQUATION (A MATH EXPRESSION WITH AN EQUALS SIGN) that SHOWS UP SO OFTEN in "REAL life" problems that it has its own NAME.

(P*)

proportion two ratios, or fractions, that are equal

(EX)

$$\frac{3}{4} = \frac{6}{8}$$

READ: "three-fourths equals six-eighths"
OR "3 is to 4 AS 6 is to 8"

MOST OF THE time in ALGEBRA
the proportion will include variables.

(Ex) $\frac{x}{6} = \frac{3}{9}$

You can solve these AS USUAL
using undos:

$$\cancel{6} \cdot \frac{x}{\cancel{6}} = \frac{3}{9} \cdot 6$$

$$\boxed{x = \frac{18}{9} = 2}$$

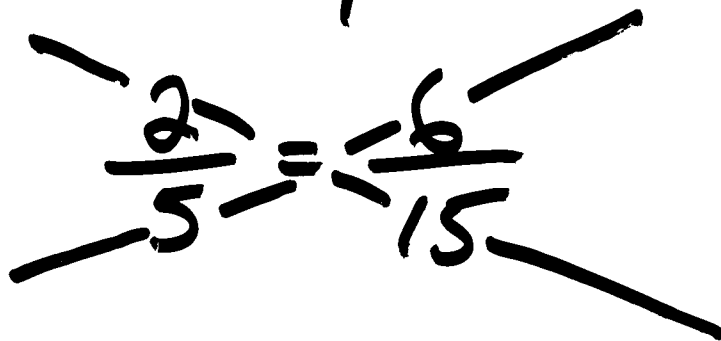
OR, you can use A property of
proportions THAT MAY BE EASIER than
"undos." What property?

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In any proportion, for example

$$\frac{2}{5} = \frac{6}{15}$$

It is always true that

"the cross-products are equal"


$$\frac{2}{5} = \frac{6}{15}$$

$$2 \cdot 15 = 5 \cdot 6$$

$$\text{OR } 15 \cdot 2 = 6 \cdot 5$$

$$30 = 30 \checkmark$$

(Ex) $\frac{x}{6} = \frac{3}{9}$

$$9x = 18$$

$$\boxed{x = 2}$$

EX 3
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$$\frac{N}{15} = \frac{24}{16}$$

$$\frac{N}{15} = \frac{3}{2}$$

Since $\frac{24 \div 8}{16 \div 8} = \frac{3}{2}$

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

X-Prod Are =

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

Is this a proportion (these 2 ratios)?

$$\frac{3}{7}, \frac{6}{15}$$

If it is, $3 \cdot 15 \stackrel{?}{=} 7 \cdot 6$

$$45 \stackrel{?}{=} 42 \text{ NO}$$

NOT A PROPORTION

Homework: • Read Ch 3-6 Rates and Proportions
• Pg 158 # 11-13, 19-22