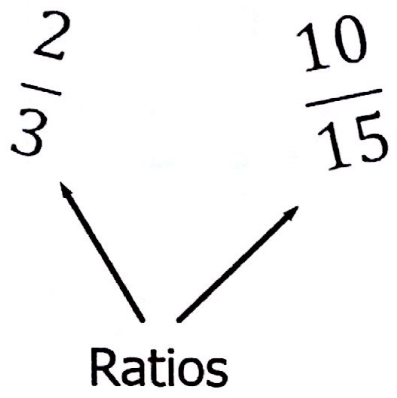
Section 2-7: Solving Proportions

A proportion is two ratios set equal to one another.

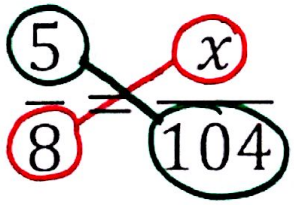


$$\frac{2}{3} = \frac{10}{15}$$

Proportion

We'll be able to solve for unknowns in proportions.

Do you remember "cross multiplying"?



$5 \cdot 104 = 8x$

$520 = 8x$

$\frac{8x}{8} = \frac{520}{8}$

$x = 65$

$$\frac{7}{8} = \frac{x}{12}$$

Do you *HAVE TO* cross multiply??

$12 \cdot \frac{x}{12} = \frac{7}{8} \cdot 12$

$x = \frac{7}{8} \cdot \frac{12}{1}$

$x = \frac{21}{2} \approx 10.5$

$$\frac{6}{x} = \frac{15}{32.5}$$

$(15)(x) = (6)(32.5)$

$15x = 195$

$x = 13$

Don't confuse cross multiplying with cross canceling. Do you know where your = is?

$$\frac{5}{8}=\frac{x}{104}$$

CROSS MULTIPLY
(Different sides of =)

$(8)(x)=(5)(104)$

⋮

see first example

⋮

$x=65$

$$\frac{15}{4}\cdot\frac{x}{6}=10$$

CROSS CANCEL
(Same sides of =)

$$\frac{\cancel{15}^{5}}{4}\cdot\frac{x}{\cancel{6}_{2}}=10$$

$$\frac{5x}{8}=10$$

$$5x=80$$

$x=16$

Don't forget that the fraction bar is a grouping symbol. There are invisible ( )s.

$$\frac{x-8}{5}\not=\frac{x+3}{4}$$

$(4)(x-8)=(5)(x+3)$

$4x-32=5x+15$

$-5x \quad -5x$

$-x-32=15$

$+32 \quad +32$

$\frac{-x}{-1}=\frac{47}{-1}$

$x=-47$

$$\frac{x}{5}\not=\frac{2x+4}{6}$$

$(x)(6)=(5)(2x+4)$

$6x=10x+20$

$-10x \quad -10x$

$\frac{-4x}{-4}=\frac{20}{-4}$

$x=-5$

All this is useful for "things" that are in proportion (like sugar packets in soft drinks). Here's an example from your book.

A florist is making centerpieces for a wedding. She uses 2 dozen roses to create 5 centerpieces. How many dozen roses will she need to make 20 centerpieces?

ROSES (DOZEN)
CENTERPIECES

$$\frac{2}{5} = \frac{x}{20}$$

$$(2)(20) = (5)(x)$$

$$100 = 5x$$

$$20 = x$$

$$x = 20$$

She will need 20 dozen roses!