Name [redacted] Date 10/4/17 W Section 1.C.6

**Solving Proportions**

To set up a proportion, you must align units straight across or up and down

To solve a proportion, you Cross multiply, simplify and isolate the Variable.

Ex. 1 A florist is making centerpieces. He uses 2 dozen roses for every 5 centerpieces. How many dozens of roses will he need to make 20 centerpieces?

$\frac{2 \text{ doz}}{5 \text{ cps}} = \frac{x \text{ doz}}{20 \text{ cps}}$ ·4

$5x = 2 \cdot 20$

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

$x = 8 \text{ doz}$

You Try 2 If 5 pounds of pasta salad serves 12 people, how many pounds of pasta salad do you need for a picnic with 60 people?

$\frac{5 \text{ lb}}{12 \text{ ppl}} = \frac{x \text{ lb}}{60 \text{ ppl}}$ ·5

$12x = 5 \cdot 60$

$\frac{12x}{12} = \frac{300}{12}$

$x = 25 \text{ lb}$

Ex. 3 Write in how the student got from each line to the next line.

| | |
|---|---|
| $\frac{2x-5}{7} = \frac{x+2}{8}$ | * Cross multiply |
| $8(2x-5) = 7(x+2)$ | * Distributive property |
| $16x - 40 = 7x + 14$ | * -7x from both sides |
| $-7x \quad -7x$ | * +40 on both sides |
| $9x - 40 = 14$ | * divide both sides by 9 |
| $+40 \quad +40$ | |
| $9x = 54$ | |
| $x = 6$ | |

} Solve

Ex. 4 $\frac{b-8}{5} = \frac{b+3}{4}$

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

$5b + 15 = 4b - 32$

$-4b \quad -4b$

$b + 15 = -32$

$-15 \quad -15$

$b = -47$

You Try 5 $\frac{8}{2x-6} = \frac{3}{x+2}$

$8(x+2) = 3(2x-6)$

$8x + 16 = 6x - 18$

$-6x \quad -6x$

$2x + 16 = -18$

$-16 \quad -16$

$\frac{2x}{2} = \frac{-34}{2}$

$x = -17$

Ex. 6 Mrs. Russell and Ms. Draper are making a candy mix. The mix started with $x$ of each type of candy, but Mrs. Russell added 3 Skittles and Ms. Draper ate 5 M&Ms. Now, the ratio of M&Ms to Skittles in the candy mix is 2 : 3. Find the original amount, $x$, of each type of candy.

$x+3$ (S)
$x-5$ (M)

$\frac{M+MS}{Skittles} = \frac{2}{3} = \frac{x-5}{x+3}$

$2(x+3) = 3(x-5)$

$2x+6 = 3x-15$

$-2x \quad -2x$

$6 = x-15$

$+15 \quad +15$

$21 = x$

$1x + 0 = -15$

$-0 \quad -0$

$x = -21$

You Try 7 Ms. Martin mixed up her crayons and colored pencils. The mix started with $x$ of each type of writing utensils, but Ms. Draper added 5 crayons and Ms. Adams borrowed 10 colored pencils. Now, the ratio of crayons to colored pencils is 4 : 3. Find the original amount, $x$, of each type of writing utensil.

$\frac{4}{3} = \frac{x+5}{x-10}$

$4(x-10) = 3(x+5)$

$4x - 40 = 3x + 15$

$-3x \quad -3x$

$1x - 40 = +15$

$+40 \quad +40$

$x = 55$

More Examples

Remember to solve proportion problems: cross multiply, simplify, and then solve.

| Examples: | $\frac{x-7}{8} = \frac{3}{4}$<br>$4(x-7) = 24$<br>$4x - 28 = 24$<br>$+28 \quad +28$<br>$4x = 52$<br>$\frac{4x}{4} = \frac{52}{4}$<br>$x = 13$ | $\frac{2x}{5} = \frac{5x+1}{100}$<br>$100 \cdot 2x = 5(5x+1)$<br>$200x = 25x + 5$<br>$175x = 5$<br>$x = 1/35$ | $\frac{3x-2}{x+5} = \frac{4}{3}$<br>$3(3x-2) = 4(x+5)$<br>$9x - 6 = 4x + 20$<br>$-4x \quad -4x$<br>$5x - 6 = 20$<br>$+6 \quad +6$<br>$5x = 26$<br>$x = 5 1/5$ |
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