

Triangle Similarity & Congruence (Ratios & Proportions Review)

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Content Objective: I will know how to compare and contrast ratios and proportions
Language Objective: I will be able to write and solve ratios and proportions
Question: What is the difference between ratios and proportions.

Study Question(s)

Ratios

A comparison of two quantities using division.

Can be expressed as:

* The ratio of a to b

* $\frac{a}{b}$

* or $a:b$

The ratio of boys to girls in high school sports is 3 to 2.

Or $3:2$ or $\frac{3}{2}$

Note:

If it were written as the ratio to girls to boys in high school sports, it would be 2 to 3.

$\frac{2}{3}$ or $2:3$

Summary

Proportion

An equation stating that two ratios are equal.

$$\frac{a}{b} = \frac{c}{d}$$

Ex #1

Solve each proportion

A) $\frac{3}{5} = \frac{x}{75}$

$$5x = 75 \cdot 3$$

$$\frac{5x}{5} = \frac{225}{5}$$

$$x = 45$$

B) $\frac{3x-5}{4} = \frac{-13}{2}$

$$2(3x-5) = -13 \cdot 4$$

$$6x - 10 = -52$$

$$\frac{6x - 10}{+10} = \frac{-52}{+10}$$

$$\frac{6x}{6} = \frac{-42}{6}$$

$$x = -7$$

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Ex #1 (continued)

Solve the proportion

$$C) \frac{x+1}{x-1} = \frac{5}{6}$$

$$6(x+1) = 5(x-1)$$

$$6x + 6 = 5x - 5$$

$$\underline{-5x}$$

$$\underline{-5x}$$

$$1x + 6 = -5$$

$$\underline{-6}$$

$$1x = -11$$

$$\boxed{x = -11}$$

$$D) \frac{x-2}{4} = \frac{x+4}{2}$$

$$2(x-2) = 4(x+4)$$

$$2x - 4 = 4x + 16$$

$$\underline{-2x}$$

$$\underline{-2x}$$

$$-4 = 2x + 16$$

$$\underline{-16}$$

$$\underline{-16}$$

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

$$\boxed{x = -10}$$

$$E) \frac{10}{x+2} = \frac{30}{x+22}$$

$$10(x+22) = 30(x+2)$$

$$10x + 220 = 30x + 60$$

$$\underline{-10x}$$

$$\underline{-10x}$$

$$220 = 20x + 60$$

$$\underline{-60}$$

$$\underline{-60}$$

$$160 = 20x$$

$$\boxed{x = 8}$$

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Ex #2

A) The ratio of male to female students in the drama club is 3:4. If there are 18 male students, how many female students are there?

$$\frac{3}{4} \propto \frac{18}{x}$$

$$3x = 72$$

* $x = 24$ female students

B) The ratio of the dimensions of a room on a map is 7:4. If the larger dimension of a room is 14 feet, what is the shorter dimension of the room?

$$\frac{7}{4} \propto \frac{14}{x}$$

$$\frac{7x}{7} = \frac{56}{7}$$

$$x = 8$$

* 8 ft. is the shorter dimension.