1.) On Thursday, 240 adults and children attended a show. The ratio of adults to children was 5 to 1. How many children attended the show?

$\frac{x}{240} = \frac{1}{6}$ x = children

$6x = 240$

$x = 40$ children

2.) On an architect's drawing of the floor plan for a house, 1 inch represents 3 feet. If a room is represented on the floor plan by a rectangle that has sides of lengths 3.5 inches and 5 inches, what is the actual floor area of the room, in square feet?

$\frac{1\text{ in}}{3\text{ ft}}$

$3.5 * 3\text{ ft} = 10.5$

$5 * 3\text{ ft} = 15$

157.5 ft^2

3.) What value(s) of x satisfies the proportion below?

$$\frac{4x}{6x+4} = \frac{x}{25}$$

$100x = x(6x+4)$

$100x = 6x^2 + 4x$

$0 = 6x^2 - 96x$

$6x = 0 \quad 6x(x-16) = 0$

$x = 0 \quad x = 0, 16$

Geometry 7-1: Ratios and Proportions

Objective: I can write ratios and solve proportions.

A ratio is a comparison of two quantities. We can write a ratio 3 different ways:

1) a to b
2) a : b
3) $\frac{a}{b}$

Example 1: A photo that is 4 inches wide and 6 inches high is enlarged to a poster that is 2 feet wide and 3 feet wide. What is the ratio of the width of the photo to the width of the poster?

high

$\frac{\text{width of photo}}{\text{width of poster}} = \frac{4\text{in}}{2\text{ft}}$

$= \frac{4\text{in}}{24\text{in}}$

$= 1/6$

QC 1: What is the ratio of the height of the photo to the height of the poster?

$$\frac{6\text{in}}{3\text{ft}} = \frac{6\text{in}}{36\text{in}} = \frac{1}{6}$$

A proportion is a statement that two ratios are equal
We can write a proportion in 2 ways:

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

2) $a:b = c:d$

There are many ways to write a proportion so that it is equivalent. You can flip the fractions, switch sides, etc. Let's look at a few ways we could change the proportion and keep both sides equal to each other.

Properties of Proportions

$\frac{a}{b}=\frac{c}{d}$ is equivalent to

(1) $ad = b \cdot c$

(2) $\frac{a}{c}=\frac{b}{d}$

(3) $\frac{b}{a}=\frac{d}{c}$

(4) $\frac{a+b}{b}=\frac{c+d}{d}$

To solve a proportion, we use a property called cross product property.

Let's see why this works:

Does $\frac{2}{3}=\frac{8}{12}$? $24=24$ ✓

Does $\frac{4}{9}=\frac{7}{16}$? NO.

Example 2: If $\frac{x}{y}=\frac{5}{6}$, complete each statement below.

a) $6x = 5y$ b) $\frac{y}{x}=\frac{6}{5}$ c) $\frac{x}{5}=\frac{y}{6}$ d) $\frac{x+y}{y}=\frac{5+6}{6}$

QC 2: Write three proportions that are equivalent to $\frac{m}{4}=\frac{n}{11}$

$\frac{m}{n}=\frac{4}{11}$ $\frac{m+4}{4}=\frac{n+11}{11}$ $11m = 4n$

$\frac{4}{m}=\frac{11}{n}$

You can solve a proportion by cross multiplying to find the value of the variable.

Example 3: Solve each proportion.

A) $\frac{x}{5} = \frac{12}{7}$

$7x = 60$

$x = \frac{60}{7}$

B) $\frac{5}{z} = \frac{20}{3}$

$15 = 20z$

$z = \frac{3}{4}$

C) $\frac{y+3}{8} = \frac{y}{4}$

$4(y+3) = 8y$

$4y + 12 = 8y$

$12 = 4y$

$y = 3$

D) $\frac{18}{n+6} = \frac{6}{n}$

$18n = 6n + 36$

$12n = 36$

$n = 3$

Classwork: Section 7.1 Worksheet (due before you leave)

HW #8 -

Section 7-1

Pages 366-368

Problems: 3 - 5, 7, 15, 18, 46

IXL #5 - A.1 & A.2

(due Friday)