Fractions

While working in a group make sure you:

- Expect to make mistakes but be sure to reflect/learn from them!
- Are civil and are aware of your impact on others.
- Assume and engage with the strongest argument while assuming best intent.

Get into groups of two to three and work on the following. Elect one person to write up your answers neatly and turn the first two pages of these activity with WrittenHW1. You may need to arrange a meeting outside of class, so consider exchanging contact information.

1. Perform the following and simplify:

$$\frac{6x}{3x+1} \cdot \frac{x-3}{x} \qquad\qquad \frac{x-2}{x} \div \frac{x}{x+1} \qquad\qquad \frac{\frac{4}{(x-5)^2}}{\frac{x}{x-5}}$$

$$\frac{x}{2x-3} + \frac{2}{x+1} \qquad\qquad \frac{x-2}{x} + \frac{x}{x+1} \qquad\qquad \frac{4}{(x+1)^2} - \frac{x}{x+1}$$

$$\frac{\frac{5x}{3}}{11} + \frac{1}{11} \qquad\qquad \frac{x-2}{\frac{x}{3}} + \frac{x}{5} \qquad\qquad \frac{\frac{4}{x+1}}{x+1} - \frac{1}{\frac{x+1}{x}}$$

2. A 100-gallon mixture of citrus extract and water is 3% citrus extract.

(a) Write a fraction with x whose values give the percentage (in decimal form) of the mixture that is citrus extract when x gallons of water are added to the mixture.

(b) Find the percentage of citrus extract in the mixture if 50 gallons of water are added to it.

3. A reservoir holds 600,000 gallons and is half-full. Scientists do tests to find that the reservoir is .75% acid.

(a) Find a fraction with x whose value give the percentage (in decimal form) of acid in the reservoir when x gallons of water are added to it.

(b) Find the percentage of acid in the reservoir if 150,000 gallons of water are added to it.

Dimensional Analysis

4. Given 1 foot (ft) is about 30.5 centimeters (cm):

(a) convert 5 ft and 4 inches into cm

(b) convert 2 cubic feet into cm^3

Language of Variation

- "P varies directly as T" means there exists a constant k so that $P = kT$

- "P varies inversely as V" means there exists a constant k so that $P = \frac{k}{V}$

1. Write "w varies directly as the square root of x and inversly as y" in math symbols.

2. Suppose y varies directly as x. If $y = 6$ when $x = 30$, find y when $x = 120$.

3. The intensity (I) of light varies inversely as the square of the distance (d) from the light source. If $I = 4$ when $d = 3$, what is d when $I = 7$?