Linear Equations & Inequalities

$4\left[4 - \frac{3}{4}x = \frac{1}{2}(x-5)\right]$

$16 - 3x = 2(x-5)$

$16 - 3x = 2x - 10$

$\frac{26}{5} = \frac{5x}{5}$

Problem Solving

1) Gather & organize information (chart)
   - *Read the ENTIRE problem.
   - *Read it again!!!!!
   - *Highlight key information
   - *Identify what you are supposed to find
2) Make the problem visual
   - *Draw & label a picture
   - *Organize info in a table
3) Develop an equation to model the situation.
   - *Assign a variable(s).
   - *Write the equation.
4) Solve and consider the solution.
   - *Is the solution logical and reasonable?
   - *Label the solution with units.

A truck leaves a Turnpike terminal traveling at 60 mph. Fifteen minutes later a car leaves the terminal traveling at 72 mph. How long will it take the car to catch the truck?

Rate – Time – Distance $R \cdot T = D$ $T = \frac{D}{R}$ $R = \frac{D}{T}$

Equal Distance

	R	x T	= D
car	72	t	$72t$
truck	60	$t + \frac{1}{4}$	$60(t + \frac{1}{4})$

t = car's travel time

$72t = 60(t + \frac{1}{4})$

$72t = 60t + 15$

$\frac{12t}{12} = \frac{15}{12} = \frac{5}{4} =$ **1.25 hr**

Mixture Problems

A snack company produces Trail Mix which contains dried fruit and mixed nuts. The cost of dried fruit is $5.50 per pound. The cost of the mixed nuts is $4.75 per pound. How many pounds of mixed nuts should be added to 10 pounds of dried fruit in order to produce Trail Mix which costs $4.95 per pound?

x = # of lbs. of mixed nuts

	Amt	Cost
Start	10 lb	\$5.50
Add	x	\$4.75
Total	$10+x$	\$4.95

$$10(\$5.50) + 4.75x = 4.95(10 + x)$$
$$55 + 4.75x = 49.5 + 4.95x$$
$$5.50 = 0.20x$$
$$27.5 = x$$

27.5 lbs. of mixed nuts

Kendra has 40 mL of a 25% copper sulfate solution. To complete a research project, she needs a 60% copper sulfate solution. How many mL of pure copper sulfate solution should she add to the 25% solution to produce the needed solution?

	mL	%
Start	40	0.25
Add	x	1.00
Total	$40+x$	0.60

x = mL of pure copper sulfate

$$40(0.25) + 1.00x = 0.60(40 + x)$$

$$10 + 1x = 24 + 0.6x$$

$$-0.6 \qquad -10$$

$$0.4x = 14$$

$$\boxed{x = 35 \text{ mL}}$$