

**December 12th**

Due Today: HW 5.6

Due Next Class: Finish worksheet 5.7

Unit: Systems part 1

Lesson: 5.7: Modeling with Systems!

**Quiz today****Get Ready:**

Check your homework answers before the quiz:

Answers to HW 5.6 (ID: 1)

1)  $(-1, -7)$   
5)  $(2, 0)$ 

2) No solution

6) Infinite number of solutions

3)  $(1, -4)$ 7)  $(3, -1)$ 4)  $(1, -4)$ 

①  $7x + 2y = -21$ ,  $2x + y = -9$

$\begin{array}{r} 2x + y = -9 \\ -2x \phantom{+ y} \\ \hline y = -2x - 9 \end{array}$

$7x + 2(-2x - 9) = -21$

$\begin{array}{r} 7x - 4x - 18 = -21 \\ \hline 3x - 18 = -21 \\ +18 \quad +18 \\ \hline 3x = -3 \\ \hline x = -1 \end{array}$

$y = -2(-1) - 9$

$\begin{array}{r} = 2 - 9 \\ \hline y = -7 \end{array}$

$x = -1$

$y = -7$

②

$$\boxed{-3x + 6y = 6},$$

$$-x + 2y = 8$$

$$\frac{-2y \quad -2x}{-1 \quad -1}$$

$$\frac{-x}{-1} = \frac{-2y + 8}{-1}$$

$$\boxed{x = 2y - 8}$$

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

$$-6y + 24 + 6y = 6$$

$$24 = 6$$

No solutions

$$\begin{array}{r} \textcircled{3} \quad -9x + 4y = -25 \\ + (+8x + 4y = +24) \\ \hline \end{array}$$
$$\begin{array}{r} \cancel{-9x} + 4y = -25 \\ \cancel{+8x} + 4y = +24 \\ \hline \end{array}$$
$$\begin{array}{r} \cancel{-9x} \\ \cancel{+8x} \\ \hline \end{array} = \begin{array}{r} -1 \\ -1 \\ \hline \end{array}$$
$$\boxed{x=1}$$
$$\begin{array}{r} -9(1) + 4y = -25 \\ -9 + 4y = -25 \\ +9 \quad +9 \\ \hline 4y = -16 \\ \frac{4y}{4} = \frac{-16}{4} \\ \boxed{y=-4} \end{array}$$

$$\textcircled{4} \quad 14x + 6y = -10 \leftarrow$$

$$-2(7x - 2y = 15)$$

$$\begin{array}{r}
 -14x + 4y = -30 \\
 + \quad 14x + 6y = -10 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 10y = -40 \\
 \frac{10y}{10} = \frac{-40}{10} \\
 \boxed{y = -4}
 \end{array}$$

$$\begin{array}{r}
 14x + 6(-4) = -10 \\
 14x + -24 = -10 \\
 +24 \quad +24 \\
 \hline
 14x = 14 \\
 \boxed{x = 1}
 \end{array}$$

$$\textcircled{7} \quad 3(-6x + 4y = -22)$$

$$2(9x + 9y = 18)$$

$$\begin{array}{r} -18x + 12y = -66 \\ + 18x + 18y = 36 \end{array}$$

$$\frac{30y}{30} = \frac{-30}{30}$$
$$y = -1$$

$$(b) \quad -6x - 6y = 12$$

$$2(-3x - 3y = 6)$$

$$-6x - 6y = 12$$

$$-6x - 6y = 12$$

$$0 = 0$$

$\infty$

$$a = a \implies \infty$$

$$a = b \implies \text{No Solutions}$$

# Quiz



## Finished the Quiz?

Copy down this problem and try to figure out a way to solve it. (For example, try using a table.)

Oz Moving and Storage rents trucks for \$15 an hour.  
FlatRate moving rents trucks for a flat fee of \$70 plus \$5 per hour. At how many hours will the moving companies cost the same price?

hrs	OZ	FR
1	15	75
2	30	80
...		
7	105	105

### **Modeling with Systems of Equations**

**Steps:**

- 1. Identify your variables.**
- 2. Write two equations that fit the situation.**
- 3. Solve your system algebraically.**
- 4. Use your solution to answer the question in a full sentence.**

Oz Moving and Storage rents trucks for \$15 an hour.  
 FlatRate moving rents trucks for a flat fee of \$70 plus \$5 per hour. At how many hours will the moving companies cost the same price?

1)  $h = \text{amount of hours}, C = \text{total cost}$

2)  $C = 15h, C = 70 + 5h$

3)

$$\begin{array}{r} 15h = 70 + 5h \\ - 5h \quad - 5h \\ \hline 10h = 70 \\ \frac{10h}{10} = \frac{70}{10} \\ \boxed{h = 7} \end{array}$$

$$\begin{array}{r} C = 70 + 5(7) \\ = 70 + 35 \\ \hline \boxed{C = 105} \end{array}$$

4)

The two companies will cost \$105 after 7 hours.

A plane flying with the wind went 270 km/hr. The same plane flying into the same wind went 198km/hr. What is the actual speed of the plane and the speed of the wind?

1)  $P = \text{plane's speed}$  ,  $w = \text{wind's speed}$

2)  $P + w = 270$  ,  $P - w = 198$

## Modeling Worksheet

Work with the people at your table.

Remember to define all variables and answer the question in a full sentence.

- ① Define  $\boxed{2}$  variables
- ② Write  $\boxed{2}$  equations
- ③ Solve the system
- ④ Answer the  $\alpha$  in a complete sentence.

#1

 $y = \# \text{ of yoga classes, } C = \text{total cost}$ 

$$C = 35y \quad , \quad C = 60 + 5y$$

$$\begin{array}{r} 35y = 60 + 5y \\ -5y \quad \quad -5y \\ \hline \end{array}$$

$$\frac{30y}{30} = \frac{60}{30}$$

$$\boxed{y=2}$$

after 2 classes,  
both will cost  
\$70.

# Recap

Homework:

Mod wksht

Today in MATH

Next Class: