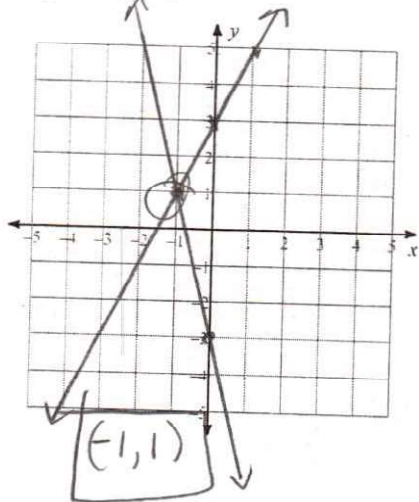Name _____ KEY 11/13

Extra Practice: Graphing Systems of Equations

Systems in Slope Intercept Form: Solve each system by graphing.

1) $y = 2x + 3$
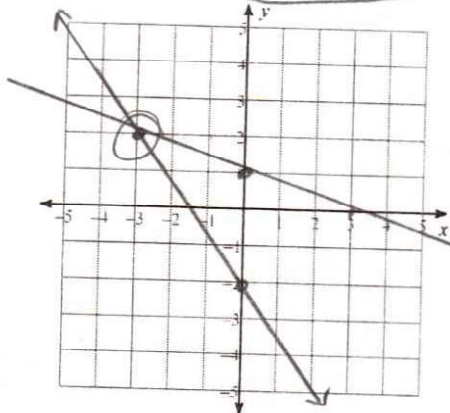$\quad y = -4x - 3$

$m = 2$
$b = 3$

$m = -4$
$b = -3$

$(-1, 1)$

2) $y = -\frac{1}{3}x + 1$
$\quad y = -\frac{4}{3}x - 2$
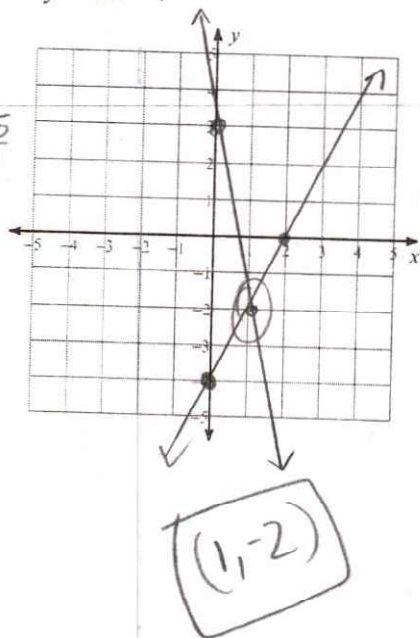
$(-3, 2)$

$m = -\frac{1}{3}$
$b = 1$

$m = -\frac{4}{3}$
$b = -2$

3) $y = -5x + 3$
$\quad y = 2x - 4$

$m = -5 \rightarrow \frac{-5}{1}$
$b = 3$

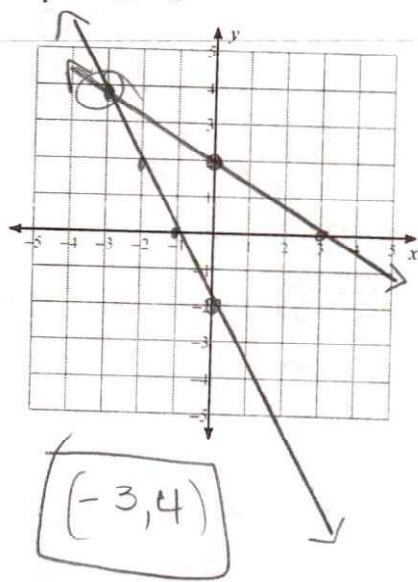$m = 2 \rightarrow \frac{2}{1}$
$b = 4$

$(1, -2)$

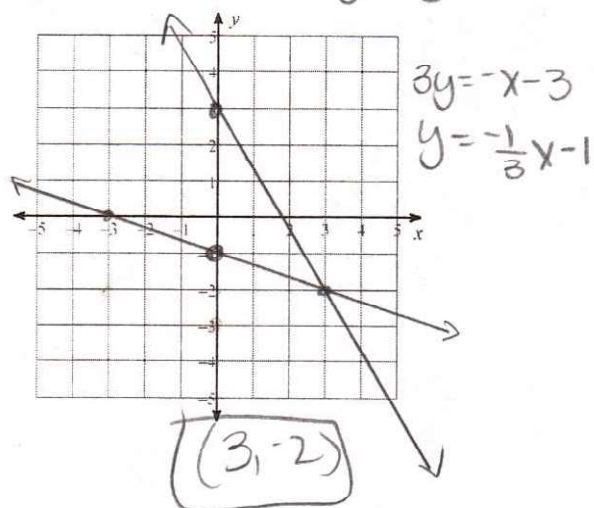4) $y = -\frac{2}{3}x + 2$
$\quad y = -2x - 2$

$m = -\frac{2}{3}$
$b = 2$

$m = -2 \rightarrow \frac{-2}{1}$
$b = -2$

$(-3, 4)$

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Systems in Standard Form: Solve each system by graphing.

5) $5x + 3y = 9$ $3y = -5x + 9$
       $x + 3y = -3$ $y = -\frac{5}{3}x + 3$
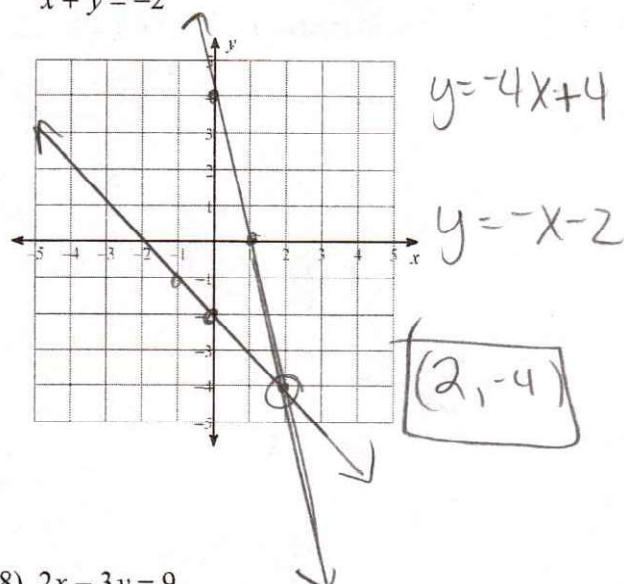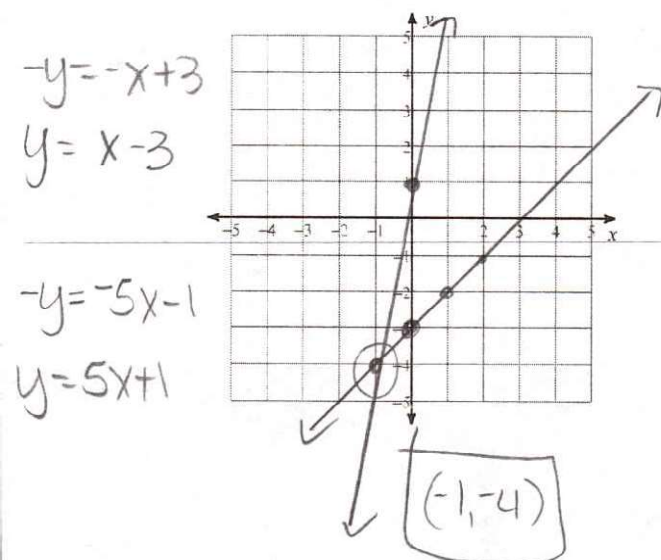
$3y = -x - 3$
$y = -\frac{1}{3}x - 1$

$(3, -2)$

6) $4x + y = 4$
       $x + y = -2$

$y = -4x + 4$

$y = -x - 2$

$(2, -4)$

7) $x - y = 3$
       $5x - y = -1$

$-y = -x + 3$
$y = x - 3$

$-y = -5x - 1$
$y = 5x + 1$

$(-1, -4)$

8) $2x - 3y = 9$
       $2x - 3y = 12$

$-3y = -2x + 9$ $-3y = -2x + 12$
$y = \frac{2}{3}x - 3$ $y = \frac{2}{3}x - 4$

no solutions

13 B
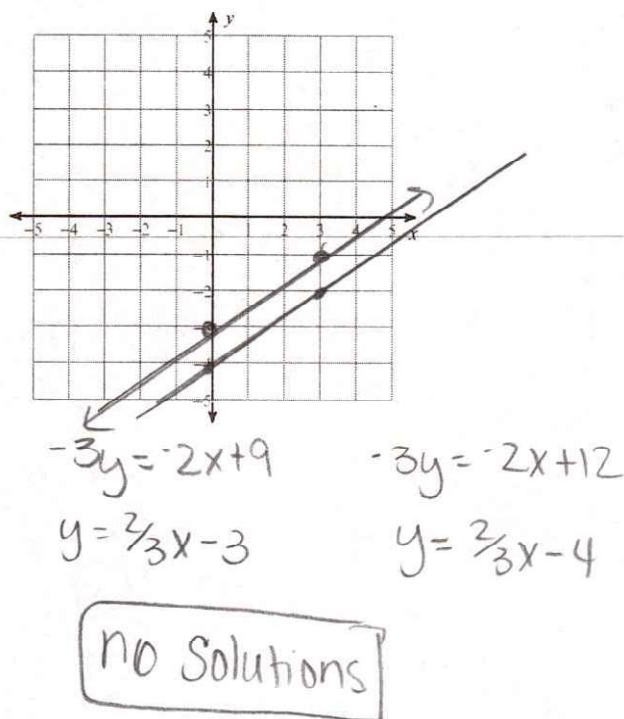
Practice Assignment

Date: _____ Block: _____

Directions: Solve each system of equations using substitution.

1. $7x + 2y = 4$
   $y = \boxed{6x + 2}$

   $7x + 2(6x + 2) = 4$ $\qquad$ $y = 6(0) + 2$
   $7x + 12x + 4 = 4$ $\qquad$ $y = 2$
   $\quad 19x + 4 = 4$
   $\qquad \underline{-4 \quad -4}$ $\qquad$ $\boxed{(0, 2)}$
   $\qquad \dfrac{19x = 0}{19 \quad 19}$
   $\qquad X = 0$

2. $10x - 2y = 7$
   $y = \boxed{5x + 6}$

   $10x - 2(5x + 6) = 7$
   $10x - 10x - 12 = 7$
   $\qquad -12 \neq 7$
   $\qquad \boxed{no\ Solution}$

3. $y = \boxed{6x - 5}$
   $y = -3x + 13$

   $6x - 5 = -3x + 13$ $\qquad$ $y = 6(2) - 5$
   $\underline{+3x \qquad +3x}$ $\qquad$ $y = 7$
   $9x - 5 = 13$
   $\underline{+5 \quad +5}$ $\qquad \boxed{(2, 7)}$
   $\dfrac{9x = 18}{9 \quad 9}$
   $\quad X = 2$

4. $x = \boxed{2y + 1}$
   $-2x + 4y = -2$

   $-2(2y + 1) + 4y = -2$
   $-4y - 2 + 4y = -2$
   $\qquad -2 = -2$
   $\boxed{Infinite\ Solutions}$

Directions: For the following scenarios, define your variables, create a system of equations, and then solve the system to answer the given questions.

5. Owen and Jim each want to run for president of the student body. In order to do so, they must collect a certain number of signatures and get a nomination. So far, Owen has 14 signatures and Jim has none. Owen is collecting signatures at an average rate of 13 per day and Jim is collecting 20 signatures per day. Assuming their rate of collection stays the same, eventually the two will have collected the same number of signatures. **How long with that take? How many signatures will they both have?**

a. Define your variables (what two things are you comparing?)

   X: # of days
   y: total signatures

b. Create a system to describe the scenario.

   Owen
   Equation 1: $y = 13x + 14$
   Jim
   Equation 2: $y = 20x$

c. Solve your system to answer the above questions.

   $13x + 14 = 20x$ $\qquad$ $y = 20(2)$
   $\underline{-13x \qquad -13x}$ $\qquad$ $y = 40$ signatures
   $\qquad \dfrac{14 = 7x}{7 \quad 7}$

   $\qquad X = 2$ days

   $\boxed{\text{It would take 2 days to get 40 signatures for both.}}$

5. Samantha is trying to decide which ice cream shop is the better buy. Dairy King charges $2.50 per sundae plus an additional $0.25 for each topping. Creamy King charges $1.50 per sundae plus an additional $0.50 for each topping. Determine the number of toppings for which both vendors charge the same amount. Explain which shop is the better buy depending on the number of toppings Samantha chooses.

a. Define your variables.

x: # of toppings

y: total costs

b. Create a system to describe the scenario.

Equation 1: $y = 2.50 + .25x$

Equation 2: $y = 1.50 + .50x$

c. Solve your system to determine when they charge the same.

$$2.50 + .25x = 1.50 + .50x$$
$$-1.50 \qquad\qquad -1.50$$
$$1.00 + .25x = .50x$$
$$-.25x \qquad -.25x$$
$$\frac{1.00}{.25} = \frac{.25x}{.25}$$

$$x = 4 \text{ toppings}$$

$$y = 1.50 + .50(4)$$
$$y = \$3.50$$

d. Create a table.

# of toppings	Dairy King $y = 2.50 + .25x$	Creamy King $y = 1.50 + .50x$
0	2.50	1.50
1	2.75	2.00
2	3.00	2.50
3	3.25	3.00
4	3.50	3.50
5	3.75	4.00
6	4.00	4.50

If you purchase 4 toppings, the costs at both places will be $3.50.

e. Conclusion on who is the better buy based off number of toppings purchased:

If you purchase less than 4 toppings, Creamy King is the better buy. If you purchase more than 4 toppings, Dairy King is the better buy.

7. You are offered two different summer jobs and you need to decide which one will pay the most money. The first job, a camp counselor pays $300 up front plus $8 per hour. The second job, a cashier at the mall, pays $11 per hour. When do the jobs pay the same amount? Which job is the better choice based on the number of hours worked?

a. Define your variables.

x: # of hours

y: total earned

b. Create a system to describe the scenario.

Equation 1: $y = 8x + 300$

Equation 2: $y = 11x$

c. Solve your system to determine when they pay the same amount.

$$8x + 300 = 11x$$
$$-8x \qquad\qquad -8x$$
$$\frac{300}{3} = \frac{3x}{3}$$
$$x = 100 \text{ hours}$$

If I work for 100 hours, then I'll make the same at both jobs ($1100).

d. Conclusion on which is the better job choice based off the number of hours worked.

If I work less than 100 hours, I should pick the camp counselor job. If I work more than 100 hours, I should pick the cashier job because I'll make more money.