

*Part A: Graphing Systems of Equations***Practice 1**

1.

Lines that have equal slope are either coincident lines or _____ lines.
parallel

2.

Systems of linear equations can have _____, one, or _____ solutions.
zero, infinite

3.

$$\begin{array}{rcl} x - y = 4 & & x + y = 3 \\ 3 - (-1) = 4 & & 3 + -1 = 3 \\ 3 + 1 = 4 & & 2 \neq 3 \\ 4 = 4 & & \end{array}$$

No, $(3, -1)$ is not a solution. It does not make the second equation true.

4.

$$\begin{array}{rcl} 2x + 5y = 1 & & y = \frac{1}{2}x - \frac{1}{4} \\ 2(3) - 5(-1) = 1 & & -1 = \frac{1}{2}(3) - \frac{1}{4} \\ 6 - 5 = 1 & & -1 = \frac{3}{2} - \frac{1}{4} \\ 1 = 1 & & -1 \neq \frac{5}{4} \end{array}$$

No, $(3, -1)$ is not a solution. It does not make the second equation true.

5.

line a and line b : $(2, 7)$

6.

line c and line b : $(-3, 2)$

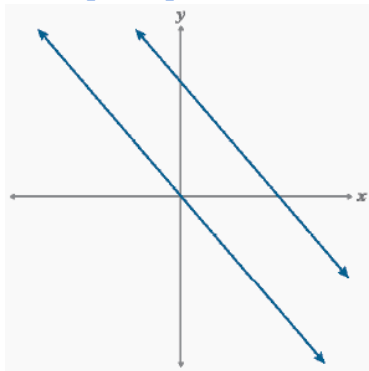
7.

line p : $y = -x + 1$

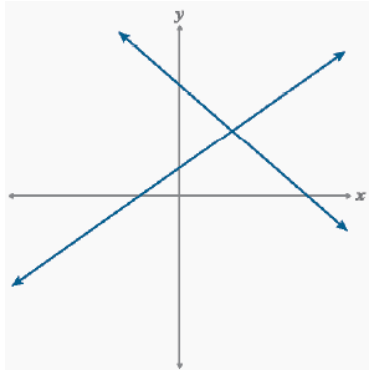
line q : $y = 2x - 2$

solution: $(1, 0)$

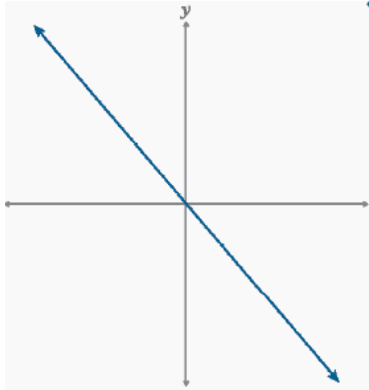
8. sample of parallel lines



9. sample of two intersecting lines

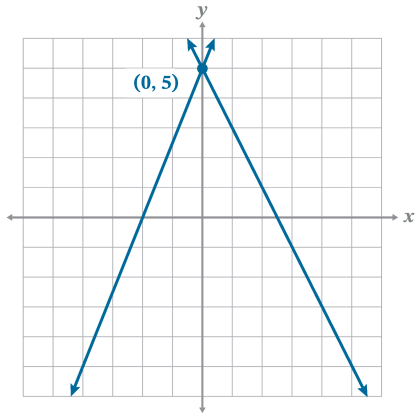


10. sample of coincident lines



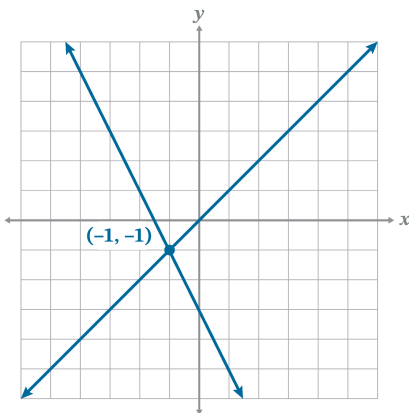
11.

$(0, 5)$



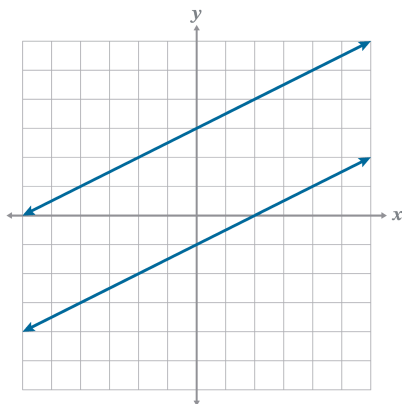
12.

$(-1, -1)$

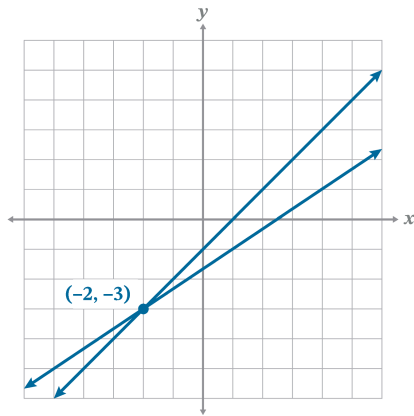


13.

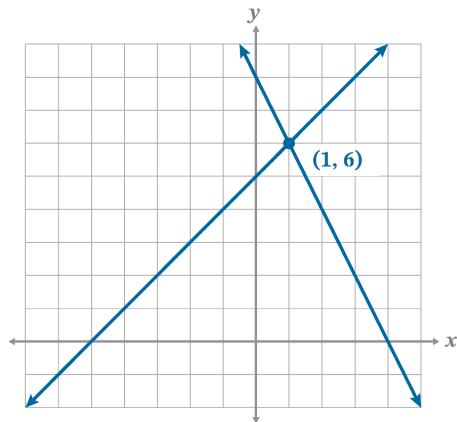
no solution, lines are parallel



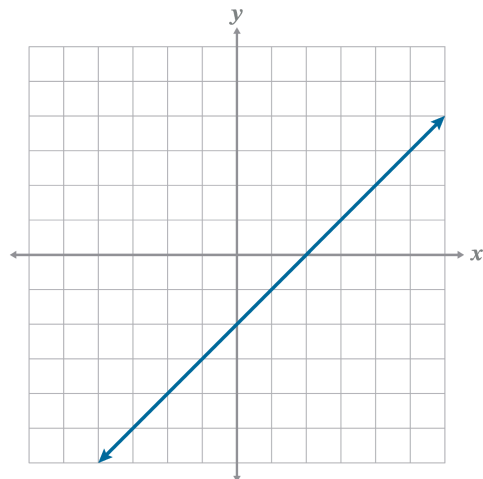
14.
 $(-2, -3)$



15.
 $(1, 6)$



16.
 infinite solutions on the line, coincident lines



Practice 2

1.

$$\begin{array}{rcl} 3x - 2y = -9 & & 3x - 5y = -21 \\ 3\left(-\frac{1}{3}\right) - 2(4) = -9 & & 3\left(-\frac{1}{3}\right) - 5(4) = -21 \\ -1 - 8 = -9 & & -1 - 20 = -21 \\ -9 = -9 & & -21 = -21 \end{array}$$

Yes, $\left(-\frac{1}{3}, 4\right)$ is a solution for the system.

2.

$$\begin{array}{rcl} 3x + 3y = 11 & & 6x + y = 7 \\ 3\left(-\frac{1}{3}\right) + 3(4) = 11 & & 6\left(-\frac{1}{3}\right) + 4 = 7 \\ -1 + 12 = 11 & & -2 + 4 = 7 \\ 11 = 11 & & 2 \neq 7 \end{array}$$

No, $\left(-\frac{1}{3}, 4\right)$ is not a solution to the system.

3.

Equation 1: $y = \frac{1}{2}x + 3$

Equation 2: $y = -\frac{1}{2}x + 7$

solution: $(4, 5)$

4.

Equation 1: $y = -\frac{3}{5}x + 3$

Equation 2: $y = -\frac{6}{5}x$

solution: $(-5, 6)$

5. C

6. A

7. B

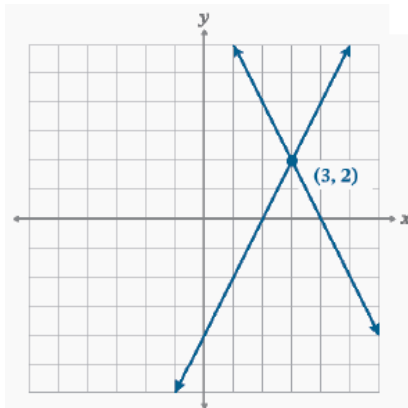
8.

line h : $y = 2x + 2$

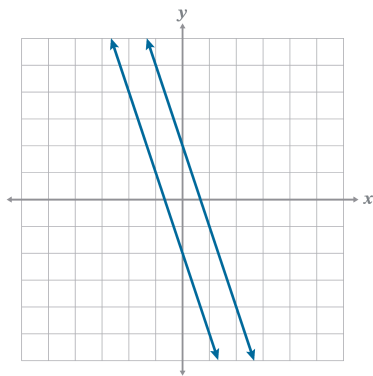
line j : $y = 3x + 1$

solution: $(1, 4)$

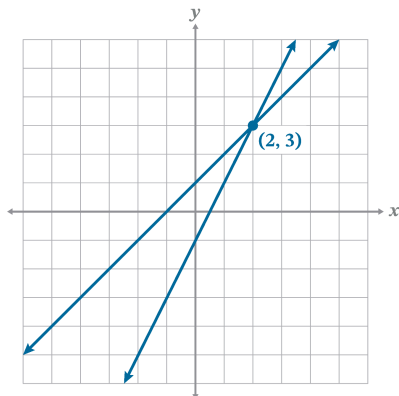
9.
(3, 2)



10.
no solution. parallel lines

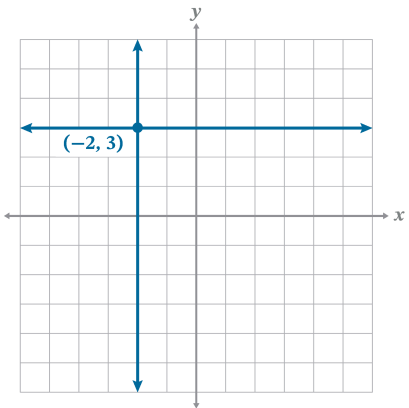


11. (2, 3)



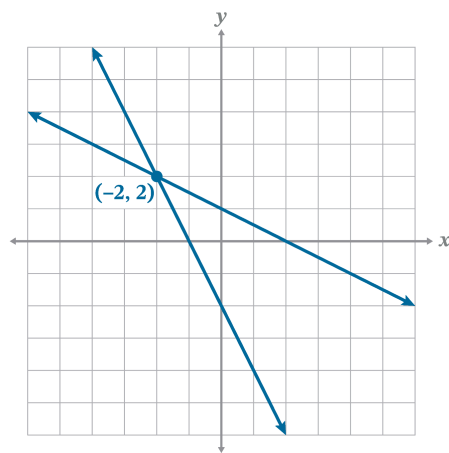
12.

$(-2, 3)$



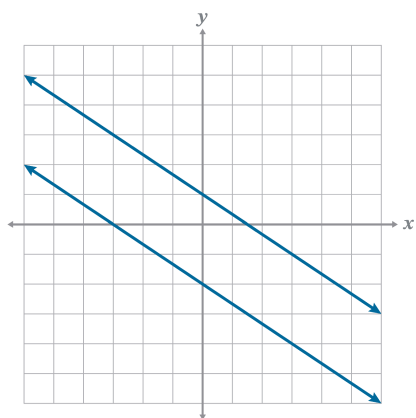
13.

$(-2, 2)$



14.

no solution, parallel lines



*Part B: Graphing Systems of Inequalities***Practice 1**

1.

line: solid or dashed

shading: above or below the line

$$m = -\frac{1}{4}$$

$$b = -2$$

$$\text{inequality: } y < -\frac{1}{4}x - 2$$

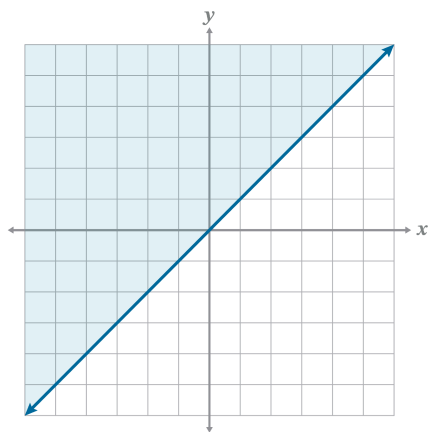
2.

line: solid or dashed

shading: above or below the line

$$m = 1$$

$$b = 0$$



3.

Points on the line _____ are solutions to a linear inequality.
sometimes

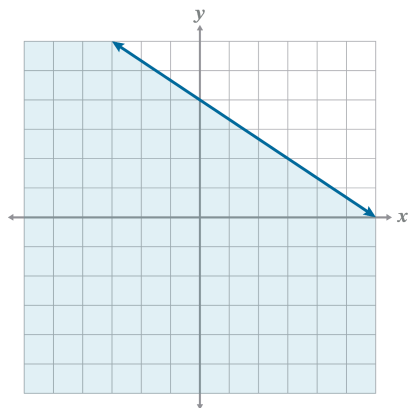
4.

The shaded region _____ represents all possible solutions.
always

5.

When dividing or multiplying by a negative coefficient the inequality symbol
_____ changes directions.
always

6.



7.

inequality p : $y \leq \frac{1}{3}x + 4$ inequality q : $y \geq 3x + 2$

8.

This is a solution because the point makes both inequalities true and is in the shaded region.

$$\begin{array}{ll} y \leq \frac{1}{3}x + 4 & y \geq 3x + 2 \\ -4 \leq \frac{1}{3}(-2) + 4 & -4 \geq 3(-2) + 2 \\ -4 \leq -\frac{2}{3} + 4 & -4 \geq -6 + 2 \\ -4 \leq \frac{10}{3} & -4 \geq -4 \text{ true} \\ -4 \leq 3\frac{1}{3} & \text{true} \end{array}$$

9.

This is not a solution because *line q* is false, and the point is not in the shaded region.

$$\begin{array}{ll} y \leq \frac{1}{3}x + 4 & y \geq 3x + 2 \\ 1 \leq \frac{1}{3}(4) + 4 & 1 \geq 3(4) + 2 \\ 1 \leq \frac{4}{3} + 4 & 1 \geq 12 + 2 \\ 1 \leq \frac{16}{3} & 1 \geq 14 \text{ false} \\ 1 \leq 5\frac{1}{3} & \text{true} \end{array}$$

10.

inequality a : $y < x + 3$ inequality b : $y \geq -x + 1$

11.

 $(2, 0)$ region A, solution

12.
 $(-2, -2)$ region D, not a solution

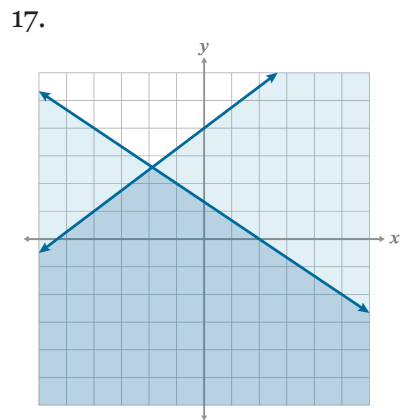
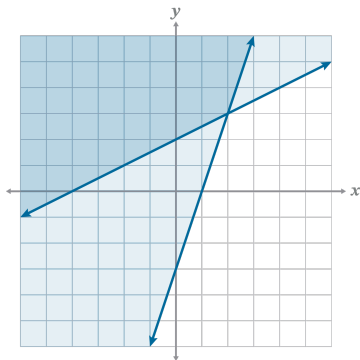
13.
 $(0, -3)$ region D, not a solution

14.
 $(5, -2)$ region A, solution

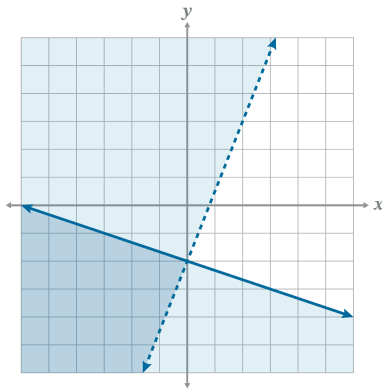
15.
 $(-3, -4)$ region B, not a solution

16.

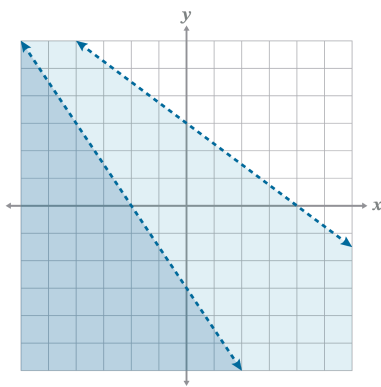
	inequality c	inequality d
line	solid	solid
shading	above	above
b	-3	2
m	3	$\frac{1}{2}$



18.



19.

**Practice 2**

1.

The shaded region represents all of the possible solutions to the inequality. Every ordered pair in the shaded region will make the inequality true. Since it is not possible to list every solution, shading is a way to show where the solutions are located.

2.

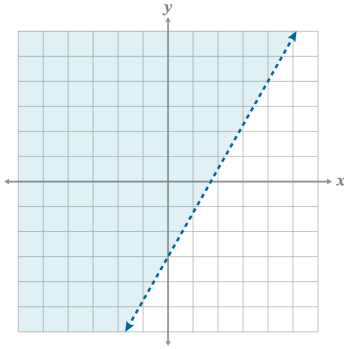
line: solid or dashed
 shading: above or below the line

$$m = 3$$

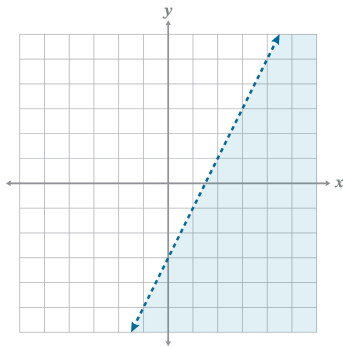
$$b = -2$$

$$\text{inequality: } y \geq 3x - 2$$

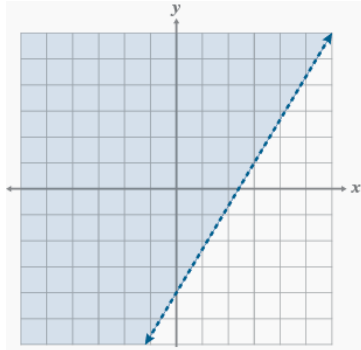
3.



4.



5.



6.

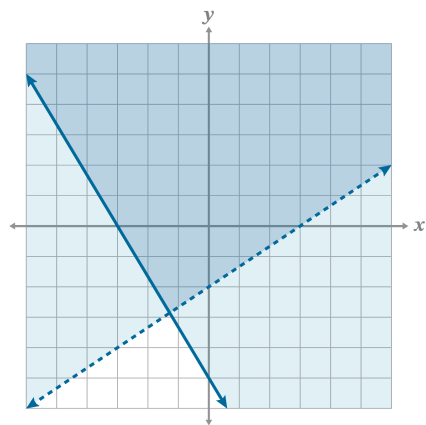
inequality a : $y < -2x + 3$ inequality b : $y \geq -x - 1$

7.

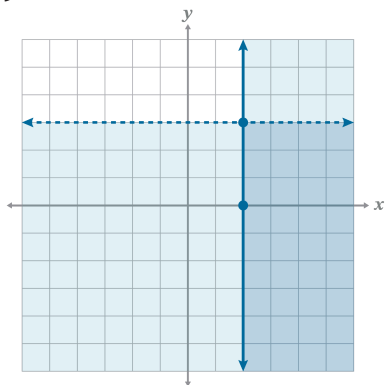
For the inequality of *line a*, the line is dashed and the shading is below the y -intercept so the symbol must be less than ($<$). For the inequality of *line b*, the line is solid and the shaded region is above the y -intercept so the symbol must be greater than or equal to (\geq).

8.

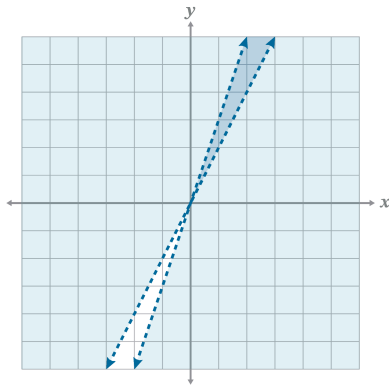
	inequality m	inequality n
line	solid	dashed
shading	above	above
b	-5	-2
m	$-\frac{5}{3}$	$\frac{2}{3}$



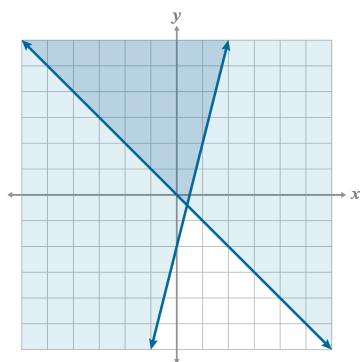
9.



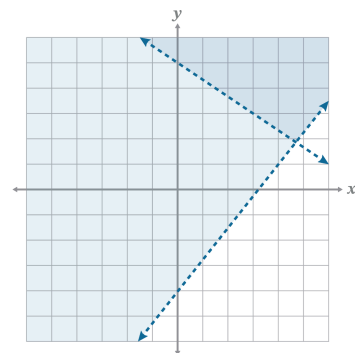
10.



11.



12.



Targeted Review

Problem	1	2	3	4	5	6	7	8	9	10	11	12	13
Lesson Origin	9	11	4	9	9	2	12	10	6	4	11	13	10

1.

$$y = 2x + 3$$

2.

$$\begin{aligned} 5x - 11y &= 28 \\ -11y &= -5x + 28 \\ \left(-\frac{1}{11}\right)(-11y) &= \left(-\frac{1}{11}\right)(-5x + 28) \\ y &= \frac{5}{11}x - \frac{28}{11} \end{aligned}$$

3.



$$\begin{aligned} 6 - 3x &\leq -4 & 2 - x &> 4 \\ -3x &\leq -10 & \text{OR} & & -x &> 2 \\ x &\geq \frac{10}{3} & & & x &< -2 \end{aligned}$$

4.

(hours, total cost)

$$y = 50x + 78$$

5.

(x, 253)

$$253 = 50x + 78$$

$$175 = 50x$$

$$x = 3.5$$

The painter worked 3.5 hours.

6.

$$\begin{aligned} \frac{2}{3}(5x - 2) &= \frac{1}{4}(x + 8) \\ 12\left(\frac{2}{3}(5x - 2)\right) &= \frac{1}{4}(x + 8) \\ 8(5x - 2) &= 3(x + 8) \\ 40x - 16 &= 3x + 24 \\ 40x - 3x - 16 + 16 &= 3x - 3x + 24 + 16 \\ 37x &= 40 \\ x &= \frac{40}{37} \end{aligned}$$

7.

$$\text{Given: } y = \frac{5}{8}x - 2$$

$$m = \frac{5}{8} \perp m = -\frac{8}{5}, (-1, 6)$$

$$y - 6 = -\frac{8}{5}(x - (-1))$$

$$y - 6 = -\frac{8}{5}x - \frac{8}{5}$$

$$y = -\frac{8}{5}x - \frac{8}{5} + \frac{30}{5}$$

$$y = -\frac{8}{5}x + \frac{22}{5}$$

8.

(people, total cost)

(40, 600), (54, 768)

$$m = \frac{(768 - 600)}{(54 - 40)} = \frac{168}{14} = 12$$

$$y - 600 = 12(x - 40)$$

$$y - 600 = 12x - 480$$

$$y = 12x + 120$$

The slope is 12. This means the cost is \$12 per person. The y -intercept is (0, 120). This means there is a fee (to rent the hall, or maybe for the food).

9.

The median would be the best measure because it is not skewed by the very low number of customers on day 4.

10.

$$\frac{5}{3} < \frac{1}{5}x - 3 \text{ and } \frac{1}{5}x - 3 \leq 9$$

$$15\left(\frac{5}{3} < \frac{1}{5}x - 3\right) \text{ and } \frac{1}{5}x \leq 12$$

$$25 < 3x - 45 \text{ and } (5)\left(\frac{1}{5}x\right) \leq (5)(12)$$

$$70 < 3x \text{ and } x \leq 60$$

$$\frac{70}{3} < x \leq 60$$

11.

$$15x + 13y = -30$$

(x, 0)

$$15x + 13(0) = -30$$

$$15x = -30$$

$$x = -2, (-2, 0)$$

(0, y)

$$15(0) + 13y = -30$$

$$13y = -30$$

$$y = -\frac{30}{13}, \left(0, -\frac{30}{13}\right)$$

12.

- As study time decreases, test grades decrease.
- All students scored above 80%.
- The average for the class was 90%.
- Students who studied more, earned higher scores.

Distractor Rationale:

2nd: (If you student chose this, they probably missed the student that studied 0 hours)

3rd: (If your student chose this, they may think you can find the average by looking at a scatter plot; however the exact values of the ordered pairs are unknown and the scale of the graph is not precise enough to determine this.)

13. B

- A. Each month Kara spent \$900.
- B. Each month Kara's family used about 75.8 gallons of propane.
- C. With 900 gallons of propane, Kara's family spends \$75.80.
- D. For every 75.8 gallons used, the family buys 900 more gallons.

Distractor Rationale:

- A. The cost is not mentioned for this problem
- C. The cost is not mentioned for this problem)
- D. 900 is a full tank of propane, and not purchased when only 75.8 gallons have been used.)