**Algebra** **Name** _____ **Hr.** _____

## 1st Semester Exam Review

# MT 1

**For Questions 1-12, solve the equation.**

1) $a - 9 = -9$

2) $-6h = -42$

3) $\frac{k}{2} = -5$

4) $2 = \frac{d}{-5} - 9$

5) $7k - 2k + 4 = 29$

6) $4(2 - 5a) + 13 = -99$

7) $4x - 1 = 8x + 2$

8) $\frac{2}{5}x - 5 = 7$

9) $2 = \dfrac{10 + z}{-3}$

10) $4(y + 4) = 40$

11) $37 - 18 + 8w = 67$

12) $8d - 4d - 6d - 8 = 2d$

**For Question 13, solve the equation. Determine whether the equation has *one solution*, *no solution*, or *infinitely many solutions*.**

13) $-8k - 9 = -26 - 8k$

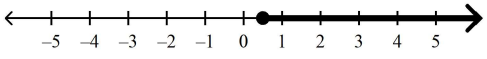
## MT 2

**For Questions 14 and 15, write the sentence as an inequality.**

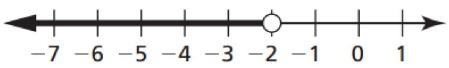
14) A number $k$ minus 10.4 is no less than 34.

15) A number $b$ times $-18$ is more than 45.

16) Write an inequality for the graph below.



17) Write an inequality for the graph below.




**For Questions 18 and 19, graph the inequality on a number line.**

18) $g \leq -4$

19) $z \leq 13.75$

**For Questions 20-23, solve the inequality. Graph the solution on a number line.**

20) $t - 5 > -6$

21) $n - (-8) \geq 14$

22) $\frac{k}{-5.5} \geq 28$

23) $-2 > -\frac{1}{5}x$

**For Questions 24-26, solve the inequality.**

24) $-5(w - 9) \leq -5w - 50$

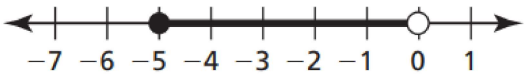
25) $5(p - 10) > 10$

26) $10q - 10 \leq 16q + 8$

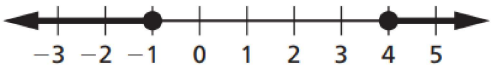
27) The senior class plans a school trip to Washington DC. Students should bring money for meals and souvenirs. They are told to bring at least $80 but no more than $130. Write a compound inequality that represents the amounts of money a student can bring.

28) The French club is sponsoring a bake sale. If their goal is to raise at least $130, how many pastries must they sell at $3.25 each in order to meet that goal? Write and solve an inequality.

29) Write a compound inequality for the graph below.




30) Write a compound inequality for the graph below.




31) Solve the compound inequality and graph your solution on a number line.

$2x - 2 < -12$ or $2x + 3 > 7$

32) Solve the compound inequality and graph your solution on a number line.

$-2 \leq 2x - 4 < 8$

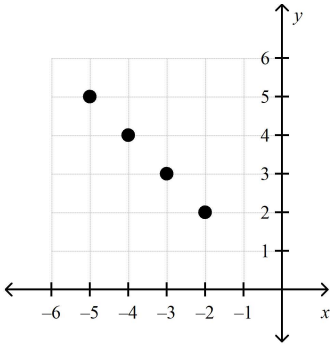
33) Solve the compound inequality and graph your solution on a number line.

$9 < x + 7 < 13$

## MT 3

**For Question 34, find the domain and range of the function represented by the graph.**

34)



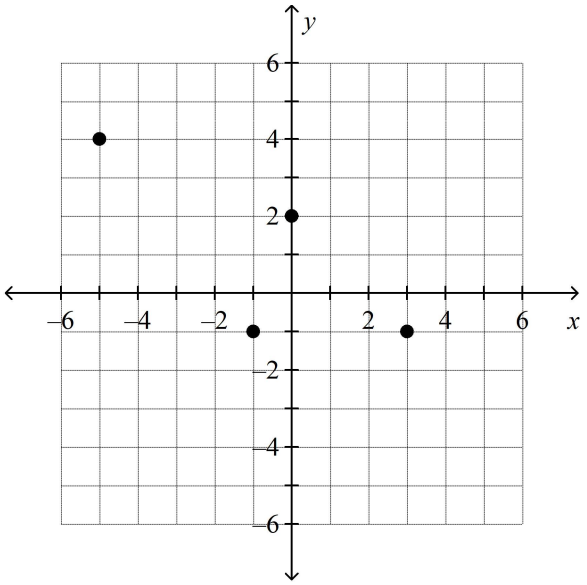

35) Create a mapping diagram that represents the relation and determine whether the relation is a function.

$\{(-3,-2),(-6,7),(9,4),(-3,2)\}$

.

36) Use the Vertical Line Test to determine whether the relation below is a function.

$\{(0,2),(3,-1),(-5,4),(-1,-1)\}$




37) Consider the function: $f(x) = 2x^2 - 2$.

a) Determine whether this is a linear function. Explain why or why not.

b) Evaluate $f(x) = 2x^2 - 2$ for $x = -1$.

**For Questions 38 and 39, find the value of *x* so that the function has the given value.**

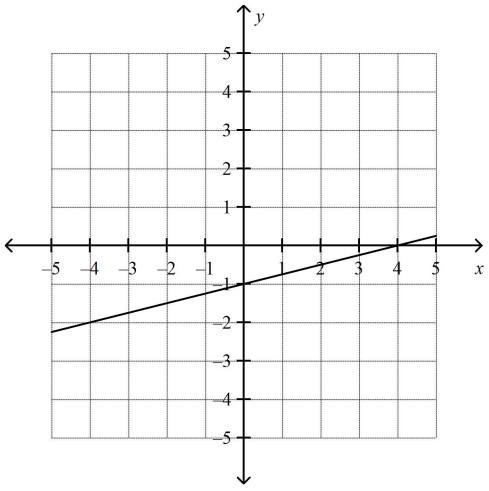
38) $n(x) = 2x + 7; \quad n(x) = 17$

39) $t(x) = 7x; \quad t(x) = 49$

40) Is the relationship shown by the data linear? Explain your answer.

| $x$ | $y$ |
|---|---|
| –7 | –4 |
| –4 | –6 |
| –1 | –8 |
| 2 | –10 |

41) Find the slope of the line graphed below.




42) Find the slope of the line that passes through the pair of points.

(4, 7), (7, 3)

43) Find the slope of the line that passes through the pair of points.

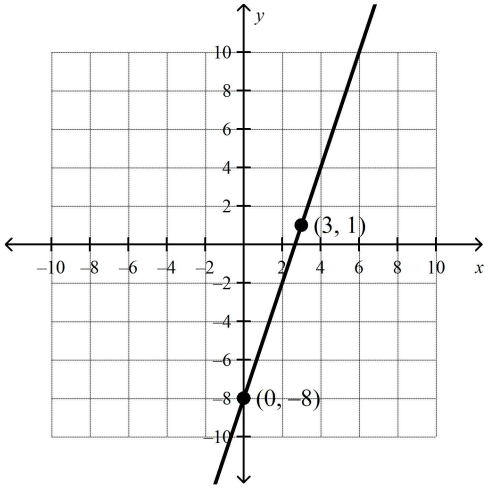
(1, 4), (6, 3)

**For Question 44, write an equation in slope-intercept form for the line with the given slope and *y*-intercept.**

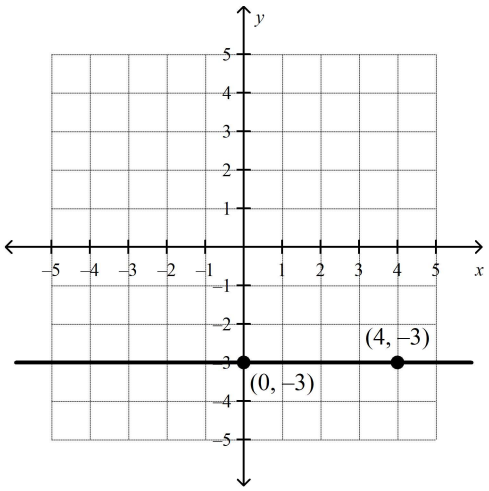
44) slope: –5
*y*-intercept: 8

**For Questions 45 and 45, write an equation of the line in slope-intercept form.**

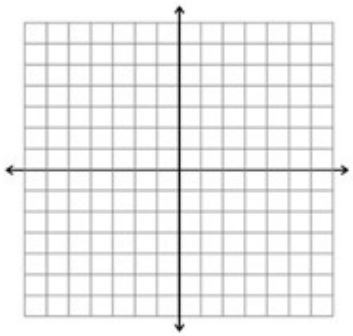
45)



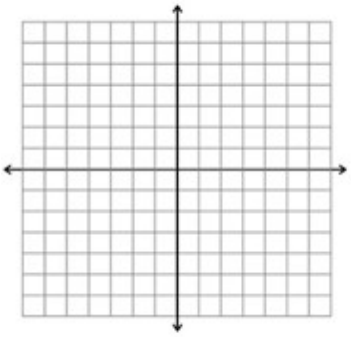

46)




47) Graph the line: $y = \frac{1}{5}x - 1$

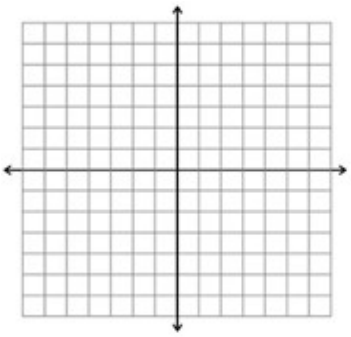


48) Graph the line: $x = -6$



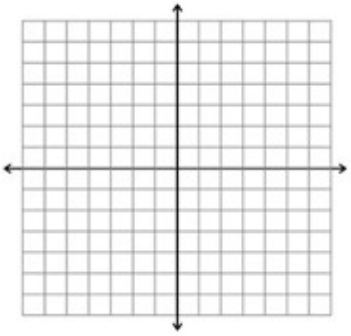
49) Find the $x$ and $y$-intercepts of the line, then graph the line.

$-7x - 6y = 84$



50) Find the $x$ and $y$-intercepts of the line, then graph the line.

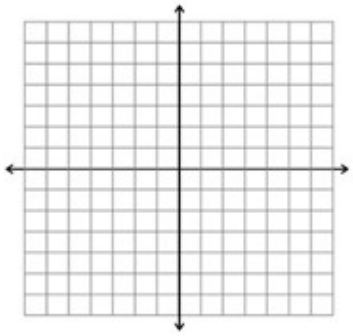
$-x + y = 8$



51) Find the slope and $y$-intercept of the line.

$15x + 10y = -30$

52) Graph the line $y = \frac{5}{6}x + 3$.



## MT 4

**For Question 53, write an equation in slope-intercept form for the line that passes through the given points.**

53) (5, –2), (0, –2)

54) Write a linear function $f$ with the values $f(0) = -3$ and $f(6) = -4$.

**For Question 55, write an equation in point-slope form of the line that passes through the given point and has the given slope.**

55) (6, –2); $m = -\frac{2}{3}$

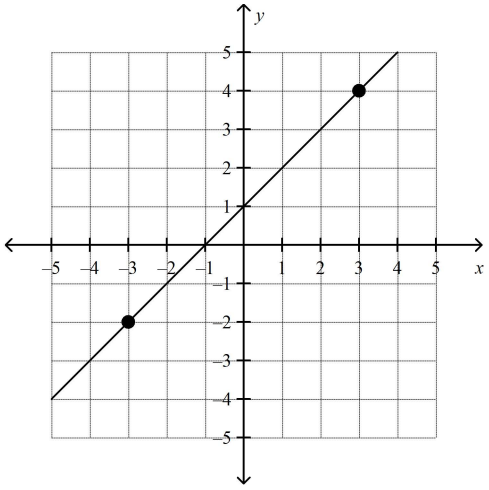
56) Write an equation of the line that passes through the given point and is parallel to the given line. (Use slope-intercept form.)

(6, –2); $y = -2x + 5$

57) Write an equation of the line that passes through the given point and is perpendicular to the given line. (Use slope-intercept form.)

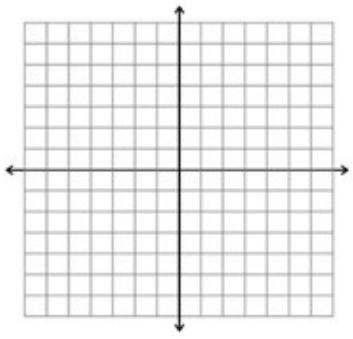
$(-3, 6)$; $y = \frac{1}{4}x - 3$

58) Write the slope-intercept form of the equation for the line.

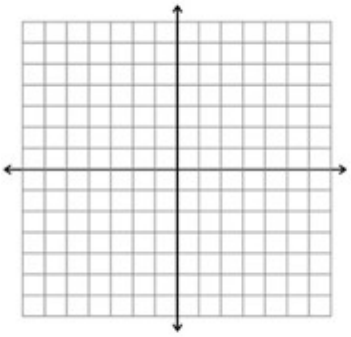



59) A line passes through (6, –4) and (7, 5).
Write an equation for the line in **point-slope** form.

60) Graph the line: $y - 2 = -(x + 3)$



61) Graph the line: $y + 1 = 4(x - 5)$



62) A line passes through (1, –5) and (–3, 7).
Write an equation for the line in point-slope form.

## MT 5A

**For Questions 63-67, solve the system of linear equations. Check your solution.**

63) $y = -x + 13$

$y = x + 7$

64) $-5x + y = 2$

$2x - 2y = -4$

65) $5x + 8y = -86$

$y = -6x - 43$

66) $5x + 5y = -5$

$4x - 5y = 14$

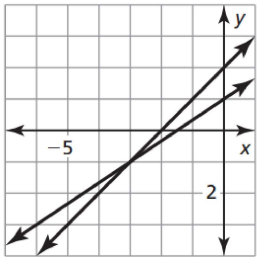
67) $y = -4x - 9$

$y = -4x + 8$

68) The system of equations is graphed below. Use the graph to determine the solution to the system. Check your solution.

$4x - 6y = -6$

$4x - 4y = -8$




69) Your school is planning a field trip to the zoo. There are two different bus companies that the school can use. Bus company A has a $45 rental fee plus $4 for each student. Bus company B has a $85 rental fee plus $2 for each student. How many students will need to go in order for the bus to cost the same from both companies?

70) School A and school B have taken a field trip to a professional baseball game. School A took 8 vans and 8 buses to get its 240 students to the game. School B took 4 vans and 1 bus to get its 54 students to the game. Find the number of students that were in each van and bus. (Hint: Write and solve a system of linear equations.)

.

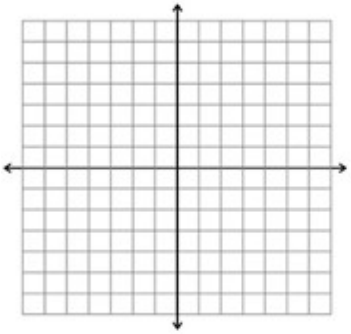
71) You need to rent a bowling lane. On Friday nights, you have two options. Option A is a $20 lane rental plus $3 per game. Option B is a $35 lane rental with a maximum of 10 games. For what number of games is the total cost the same for each option?

.

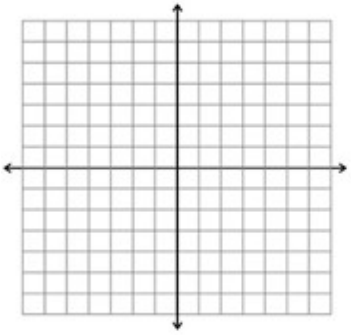
## MT 5B

**For Questions 72 and 73, graph the inequality in a coordinate plane.**

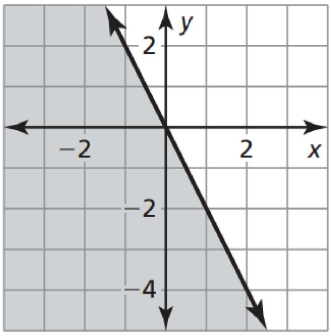
72) $y < -2$



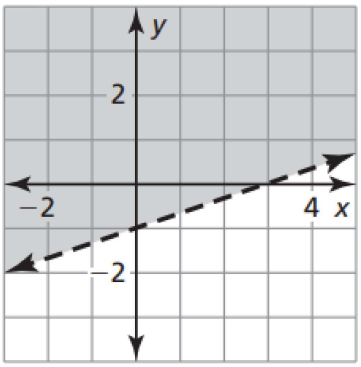
73) $y \geq -2x + 3$



74) Write the inequality represented by the graph below.



75) Write an inequality that is represented by the graph below.




76) Tell whether the ordered pair is a solution of the inequality.

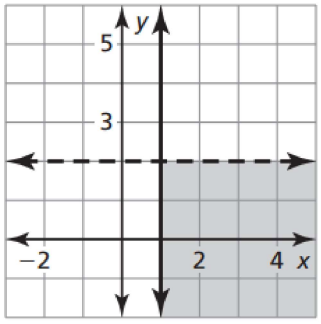
$x - y > 2; (5, 4)$

77) Tell whether the ordered pair is a solution to the system of linear inequalities.

$(2, -1); y \geq 3$

$y < x + 1$

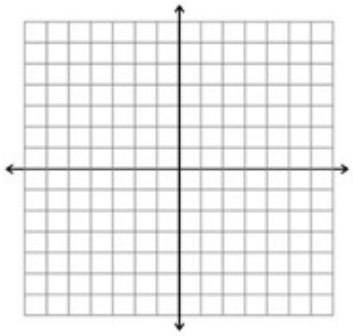
78) Write a system of linear inequalities represented by the graph.



**Graph the system of linear inequalities.**

79) $y \geq -4$

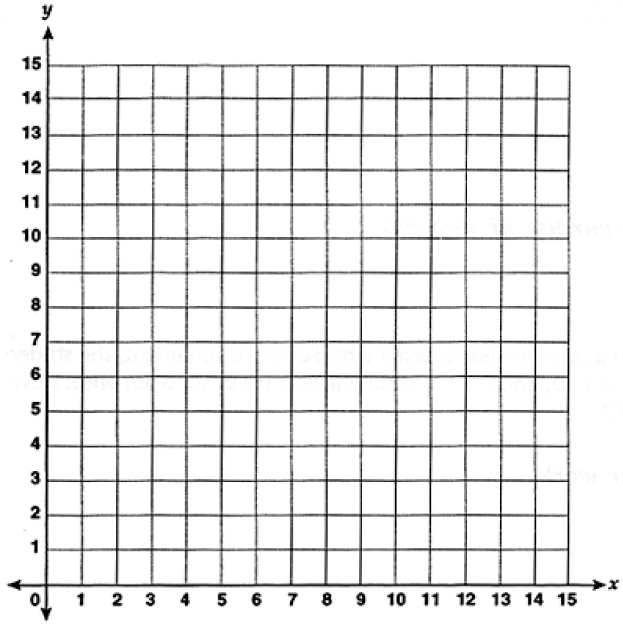
$y < 5x + 2$



80) You have at most \$105 to spend on video games. Used video games cost \$7 each and new video games cost \$35 each. Assume $x$ represents the number of used video games and $y$ represents the number of new video games.

a) Write an inequality that represents this situation.

b) Graph the inequality. (Don't forget to shade your graph!)




c) Can you purchase 8 used video games and 2 new video games? Explain.