

Modern English School  
Cairo



**American Section Mathematics Department**

# Summer work for Algebra 2 students



Please complete the following questions showing full work. Submit to your Algebra 2 Honors teacher on the first day of term.

**Solve the following equations if possible.**

1.  $3x + 1 = 5x$

2.  $8 - 2y = 21 - 6y$

3.  $\frac{1}{2}(14 + 8a) = 9a$

4.  $7 - 6d = 3(5 - 2d)$

5.  $-7(b + 1) = 5(b - 2)$

6.  $4x - (2x - 8) = -(3x - 6)$

7.  $x - 4(x - 12) = -8$

**Solve the equation. Round to the nearest *hundredth*.** (you may use your calculator on these)

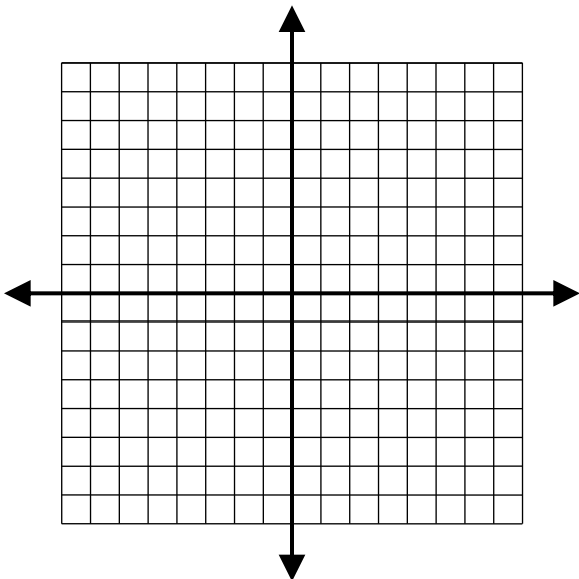
8.  $15y - 8 = 4y - 3$

9.  $2(2n + 11) = 31 - 3n$

10.  $7.6x + 3.7 = 2.8 - 1.6x$

11. Plot and label the ordered pairs in a coordinate plane. Indicate what Quadrant each point is in, and if not in a quadrant, state where it is.

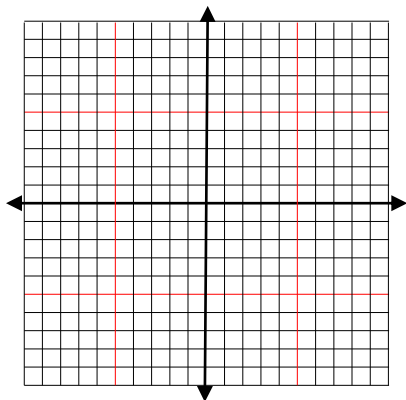
$A(2, 4), B(-2, 0), C(5, -2)$



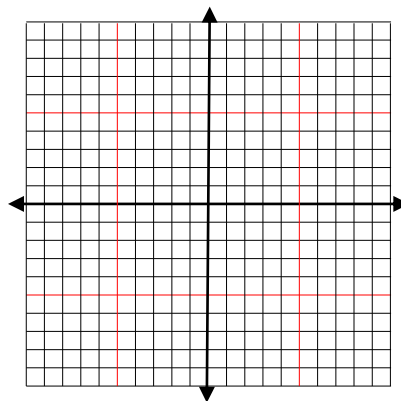
12. Use a table of values to graph the following equations.

a.  $y = 5x + 1$

b.  $x = -2$



$x$	$y$



$x$	$y$

13. Find the  $x$ -intercept and the  $y$ -intercept of the line below, and graph the equation.

a.  $5x + y = -5$

b.  $2x - y = 6$

c.  $y = 1$

$x$ -intercept: \_\_\_\_\_

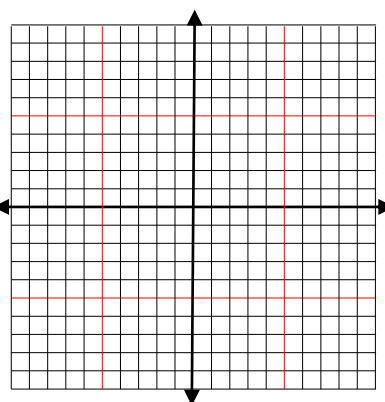
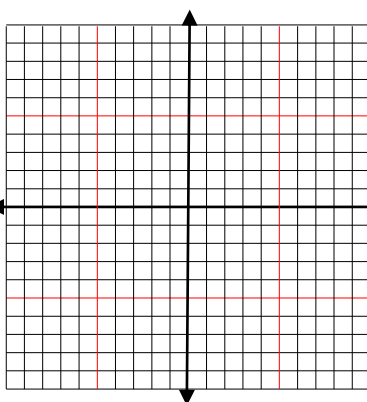
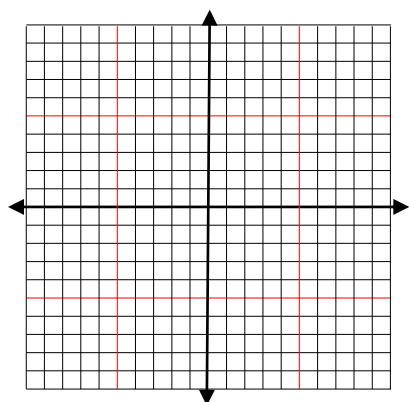
$x$ -intercept: \_\_\_\_\_

$x$ -intercept: \_\_\_\_\_

$y$ -intercept: \_\_\_\_\_

$y$ -intercept: \_\_\_\_\_

$y$ -intercept: \_\_\_\_\_



14. Write the formula for finding the slope,  $m$ , of a line passing through two given points  $(x_1, y_1)$  and  $(x_2, y_2)$ .

15. Find the slope,  $m$ , of the line passing through the given two points.

a.  $(6,1),(-4,1)$

b.  $(2,2),(-1,4)$

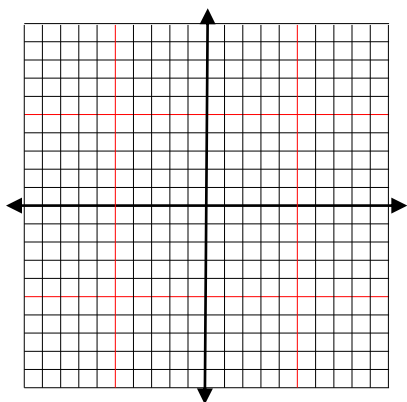
16. Write the equation for slope-intercept form. \_\_\_\_\_

17. Write the following equations in slope-intercept form. State the slope and y-intercept. Then, graph the equation.

a.  $x - y = 1$

$m =$  \_\_\_\_\_

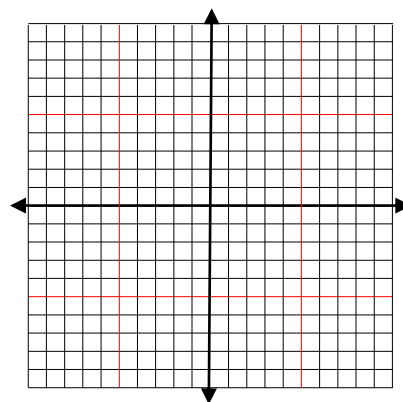
$y\text{-int} =$  \_\_\_\_\_



b.  $-3x + 2y = 6$

$m =$  \_\_\_\_\_

$y\text{-int} =$  \_\_\_\_\_



18. Decide whether the graphs of the two equations are parallel lines. Explain your answer.

$y = 3x + 2$

a.  $y = \frac{1}{3}x + 4$

$y = 5x + 1$

b.  $3y = 15x + 4$

What are the general equations for the three ways to write the equation of a line?

19.) \_\_\_\_\_

20.) \_\_\_\_\_

21.) \_\_\_\_\_

Write an equation of the line with the given slope and y-intercept. Write the equation in slope-intercept form.

22.)  $m = -4$ ,  $b = 3$  \_\_\_\_\_ 23.)  $m = \frac{1}{4}$ ,  $b = -3$  \_\_\_\_\_

Write an equation of the line that passes through the given point and has the given slope. Write the equation in slope-intercept form, point-slope form, and standard form.

24.)  $(3, -9)$ ,  $m = -5$

Point-Slope Form: \_\_\_\_\_

Slope-Intercept Form: \_\_\_\_\_

Standard Form: \_\_\_\_\_

25.)  $(1, 8)$ ,  $m = -4$

Point-Slope Form: \_\_\_\_\_

Slope-Intercept Form: \_\_\_\_\_

Standard Form: \_\_\_\_\_

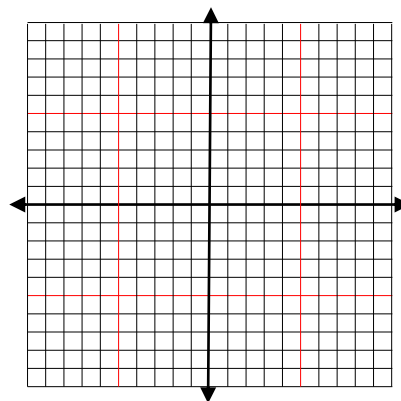
Graph the line that passes through the given points. Then, write the equation of the line in point-slope form, slope-intercept form, and standard form.

26.)  $(6, 2), (8, -4)$

Point-Slope Form: \_\_\_\_\_

Slope-Intercept Form: \_\_\_\_\_

Standard Form: \_\_\_\_\_

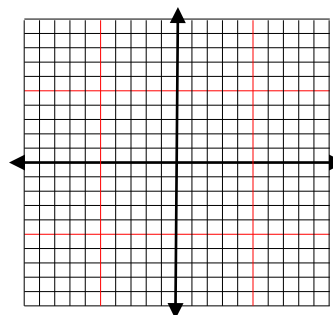


27.)  $(5, -1), (5, 4)$

Point-Slope Form: \_\_\_\_\_

Slope-Intercept Form: \_\_\_\_\_

Standard Form: \_\_\_\_\_

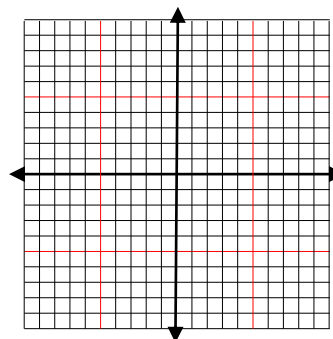


28.)  $(1, -1), (6, -1)$

Point-Slope Form: \_\_\_\_\_

Slope-Intercept Form: \_\_\_\_\_

Standard Form: \_\_\_\_\_



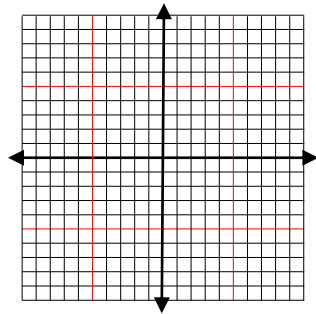
Write an equation of the line for the following lines. Give the equation in slope-intercept form.

29.) A line parallel to the line  $y = \frac{1}{3}x + 7$ , and passes through the point  $(-1, -2)$ .

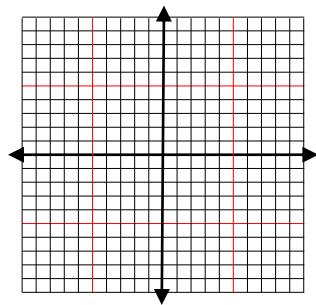
- 30.) A line perpendicular to  $y = -2x + 6$  and passes through the point  $(-4, 7)$ .

**Solve the following linear systems by graphing.**

31.  $y = 5$   
 $x = -2$



32.  $y = \frac{1}{2}x + 5$   
 $y = -3x + 5$



**Solve the following linear systems using the SUBSTITUTION method.**

33.  $x = 5y$   
 $2x + 3y = -13$

34.  $5x - 8y = -17$   
 $3x = 5 + y$

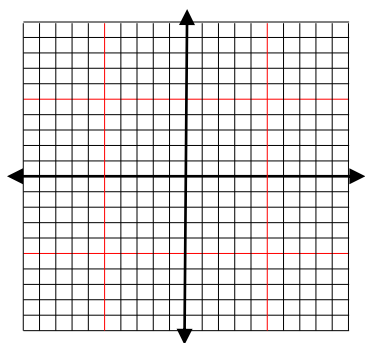
**Use the ELIMINATION method to solve the following linear systems.**

35.  $2x - 3y = -7$   
 $3x + y = -5$

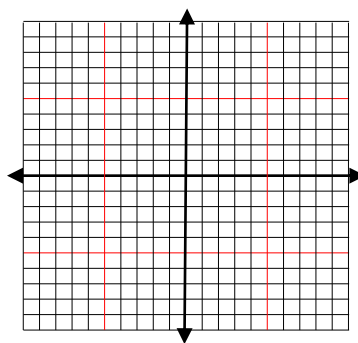
36.  $4x + 3y = 31$   
 $y = 2x + 7$

**Graph the following linear inequality.**

37.  $y \leq 2x + 3$



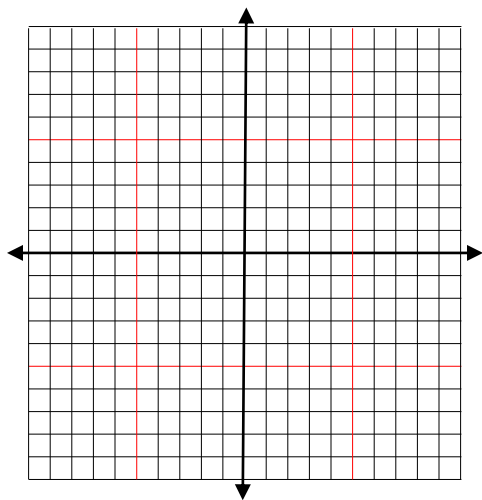
38.  $-3x - y < -7$



**Graph the following systems of linear inequalities.**



$$\begin{array}{l}
 2x + y \leq 4 \\
 39. \quad -3x + y < 3 \\
 y \geq -4
 \end{array}$$

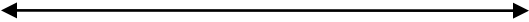











Use the method of your choice to solve the linear system and tell how many solutions the system has.

$$\begin{array}{l}
 40. \quad -6x - 6y = -12 \\
 -2x - 2y = -4
 \end{array}$$

$$\begin{array}{l}
 41. \quad 2x + y = 7 \\
 4x + 2y = -10
 \end{array}$$

Solve the inequality and graph its solution.

42.  $x+7 \leq 11$  \_\_\_\_\_ 
43.  $-4x > 12$  \_\_\_\_\_ 
44.  $\frac{-x}{3} \geq -6$  \_\_\_\_\_ 
45.  $-7-4x < 13$  \_\_\_\_\_ 
46.  $2x+3 > 6x-1$  \_\_\_\_\_ 
47.  $6x+3 = 3(x-2)$  \_\_\_\_\_ 
48.  $3x-2 \leq 7x-10$  \_\_\_\_\_ 
49.  $-15 \leq 5x < 20$  \_\_\_\_\_ 
50.  $-3 \leq 4x+5 \leq 7$  \_\_\_\_\_ 
51.  $8x-11 < 5$  or  $4x-7 > 13$  \_\_\_\_\_ 

**Solve the following absolute value equations.**

52.  $|2x-6| = 20$

53.  $|x-6| + 8 = 10$

**Solve and graph the following inequalities:**

54.  $|x+8| \leq 12$

55.  $|x+7| > 28$



**Is each ordered pair a solution to the inequality?**

56.  $x > 24$   
 $(33, 2)$  \_\_\_\_\_  
 $(-1, 7)$  \_\_\_\_\_

57.  $y - 2x > 5$   
 $(6, 3)$  \_\_\_\_\_  
 $(3, -8)$  \_\_\_\_\_

**Add or subtract the following.**

60.  $(x^2 + 4x - 1) + (5x^2 + 2)$

61.  $(5x^2 - 9x + 1) - (8x + 13)$

62.  $(7x^3 + 2x^2 - x - 4) - (4x^3 - 3x^2 + 8)$

63.  $(x^4 + 6x^2 + 7) + (2x^4 - 3x^2 + 1)$

**Simplify the expression. The simplified expression should have no negative exponents.**

83.  $x^3 \cdot x^4$

84.  $a^0 \cdot a^4$

85.  $b^2 \cdot b^{-5}$

86.  $5y^{-4}$

87.  $(x^3)^7$

88.  $(a^{-2})^3$

89.  $\frac{n^3}{n^5}$

90.  $(2b)^3(b^{-4})$

91.  $(mn)^2 \cdot n^4$

92.  $3a^5 \cdot 5a^{-2} \cdot a^3$

93.  $\left(\frac{x^3}{xy^4}\right)\left(\frac{y}{x}\right)^5$

94.  $\frac{a^{-1}b^2}{ab} \cdot \frac{a^2b^3}{b^{-2}}$

**Evaluate the expression.**

95.  $5^4 \cdot 5^{-1}$

96.  $4^{-3}$

97.  $(425ab^{-1}xy^2)^0$

98.  $\left(\frac{5}{2}\right)^{-2}$

99.  $\frac{3 \cdot 3^5}{3^4}$