

NAME: _____

Answer the following questions. Show your work. Answers should be in simplest fraction form, unless it is money. Don't forget to include units where appropriate. When graphing make sure that the function fills up most of the coordinate plane.

A. Write the **algebraic model** for the following verbal models:

- 1) The sum of 12 and the quantity 8 times a number is equal to 48.

- 2) The difference of a number and 7 is greater than 10 and less than or equal to 20.

B. Check whether the given numbers are **solutions** to the functions.

- 3) $f(x) = 6x - 7 = 29$; 5

- 4) $g(x) = x - 3.5 < 6$; 9

C. **Problem Solving:** Write the equation or inequality that you use to solve the problem.

- 5) You buy a storage rack that holds 40 DVDs. You already have 27 DVDs. You want to buy 15 more DVDs. Will they fit on the rack?

- 6) You are comparing two dorm-sized refrigerators, both with cube-shaped interiors. One model has an interior edge of 14 inches and the other has an interior edge of 16 inches. How much more cubic inches does the larger model have?

- 7) Each of the long sides of a rectangle has a length of x inches. Each of the other sides is 1 inch shorter than the long sides. The perimeter of the rectangle is 22 inches. Determine the length & width of the rectangle. Determine the area of the rectangle.

$$L = \underline{\hspace{2cm}} \quad w = \underline{\hspace{2cm}}$$

$$A = \underline{\hspace{3cm}}$$

- 8) You are making a scale drawing of your classroom using the scale 1 in : 3 ft. The floor of your classroom is a rectangle with a length of 21 ft and a width of 18 ft. What should the length and width of the floor in your drawing be?

9) A golf course charges \$45 to play 18 holes of golf. It charges \$24.75 to play 9 holes. Find the cost per hole for each game. Which game costs less per hole to play?

10) You have 26 DVDs and plan to buy 2 more each month. Write a rule for the number of DVDs as a function of the number of months from now. Identify the independent and dependent variables, domain, and range.

11) An architect is making a scale drawing of a building using a scale of 1 in : 4 ft. The height of the building on the drawing is 23 inches. What is the height of the actual building?

Height = _____

12) Evaluate: $35 - [6 + (4^2 \div 2)] =$ _____

13) Evaluate: $\frac{27-13}{4^2-9} =$ _____

14) Evaluate: $7x^2 - 4x$ when $x = 3$ _____

15) Evaluate: $-\sqrt{121} =$ _____

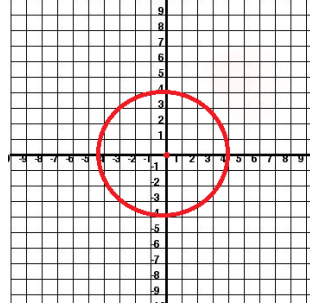
D. **Functions:** Determine whether the following are functions, explain your answer.

16) (2, 5), (4, 8), (3, 9)

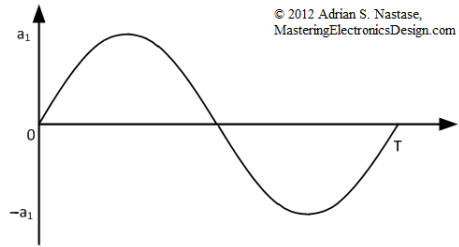
17)

x	1	5	7	9	13
y	5	13	19	27	35

18) _____

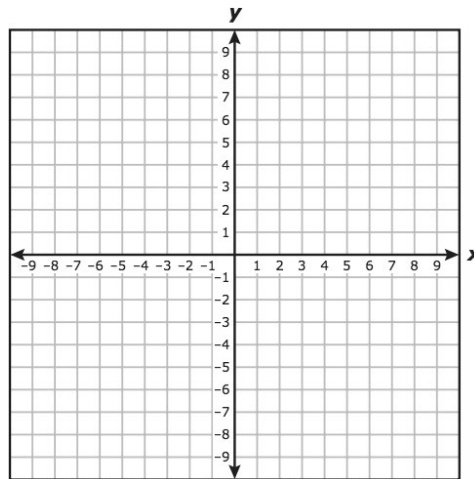


19) _____

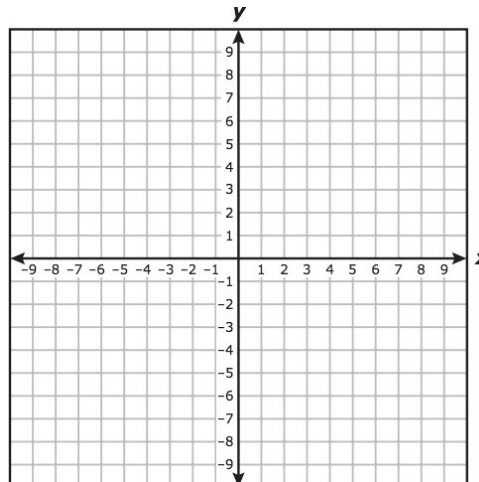


E. Linear Equations/Inequalities.

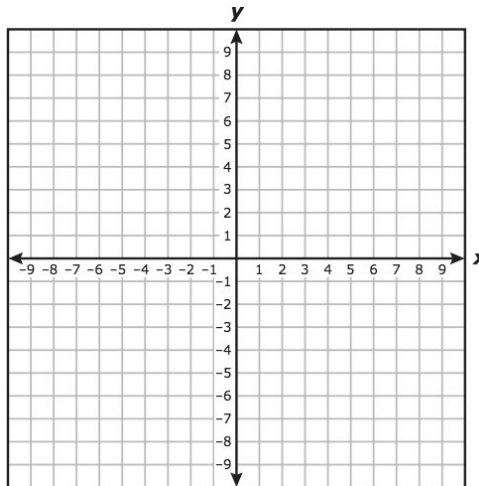
20) Graph $y = x + 2$



21) Graph $y = \frac{-1}{2}x + 4$



22) Graph $6x + 2y = 8$



23) The table shows the cost of using a computer at an internet café for a given amount of time. Find the rate of change in cost with respect to time.

Time (hours)	2	4	6
Cost (dollars)	7	14	21

24) Find the slope of the line containing the points: $(1, -3)$ and $(6, 5)$

25) Identify the slope and y intercept of the line: $y = -4x - 12$?

26) Identify the slope and intercept of the line: $3x - 9y = 27$

27) Write an equation of the line in slope intercept form of the line that passes through the given point and has the given slope m : $(1, 3)$ and $m = 4$

28) Write the equation of the line in slope intercept form of the line passing through the points: $(0, 5)$ and $(6, 9)$

29) Write the equation of the line in slope intercept, point-slope, and standard form for the line going through the points: $(7, 4)$ & $(5, 3)$.

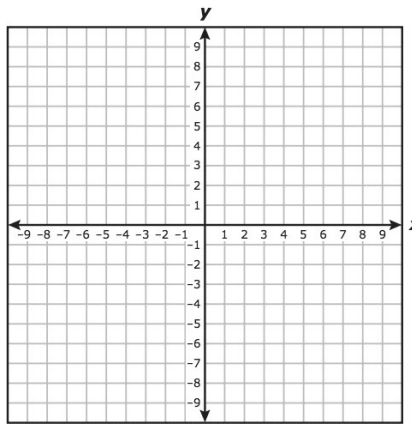
Slope-intercept: _____

Point-slope: _____

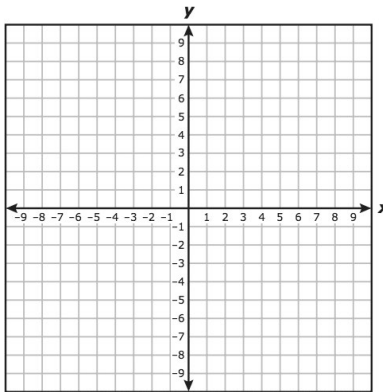
Standard: _____

30) Write the equation of the line for the line that is parallel to $y = x + 3$ and goes through the points $(9, 4)$.

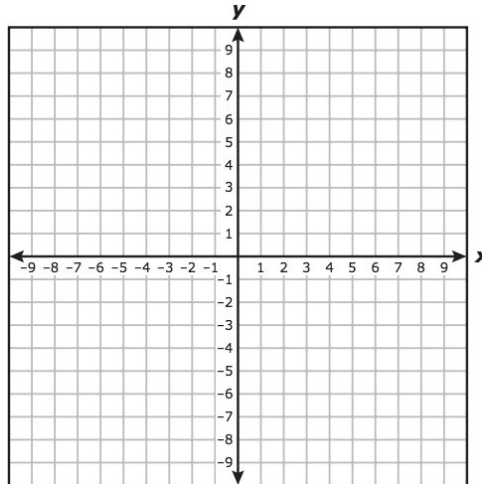
31) Graph: $y < 2x + 5$



32) Graph $x \leq -3$



- 33) Graph
 $y < 3x + 4$
 $y \geq -2x - 1$



F. **Solve** the following equations/inequalities. Show your work. Graph the solution for inequalities.

34) $15x - 17 = 13$ $x =$ _____

35) $-12x + 39 = -4x - 17$ $x =$ _____

36) $3(3x + 4) = 54 + 6x$ $x =$ _____

37) $\frac{1}{3}(24x - 66) = 3x + 43$ $x =$ _____

38) $\frac{k}{7} - 9 = 33$ $k =$ _____

39) $17 = -5x - 6x + 14$ $x =$ _____

40) $\frac{1}{2} = 4(5x - 3)$ $x =$ _____

41) $2(x + 3) = \frac{3}{4}(8x - 12)$ $x =$ _____

42) $\frac{4}{7} = \frac{x}{56}$ $x =$ _____


43) $\frac{13}{x} = \frac{26}{x+5}$ $x =$ _____


44) $\frac{-5x}{4} = \frac{15}{2}$ $x =$ _____


45) $\frac{34}{6} = \frac{2x+1}{3}$ $x =$ _____


46) $\frac{-4x-1}{-10x} = \frac{3}{8}$ $x =$ _____

47) $\frac{2x+7}{6} = \frac{5x-2}{5}$ $x =$ _____

48) $5x + 9 < 4$ _____ 

49) $3(s - 4) \geq 2(s - 6)$ _____ 

50) $2(4c - 7) \geq 8(c - 3)$ _____ 

51) $2.2h + 0.4 \leq 2(1.1h - 0.1)$ _____ 

52) $6 < x + 5 \leq 11$ _____ 

53) $16 < -x - 6$ or $2x + 5 \geq 11$ _____ 

54) $|x - 3| = 8$ _____

55) $3|2x - 7| - 5 = 4$ _____

56) $|x - 5| \geq 7$ _____

57) $2 \left| \frac{1}{4}x - 5 \right| - 4 > 3$ _____

58) Solve the linear system: $y = -x + 4$
 $y = 2x - 8$ _____

59) Solve the linear system: $6x + 12y = -6$
 $2x + 5y = 0$

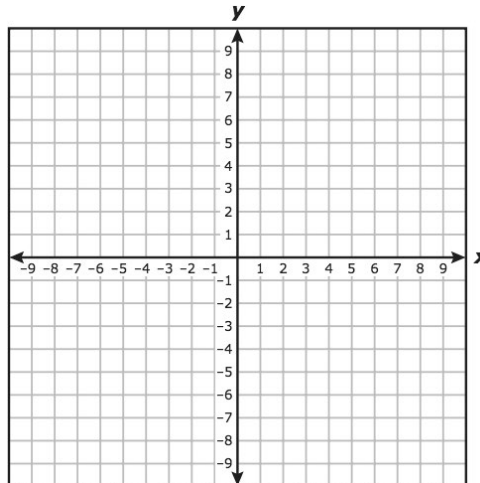
60) Solve the linear system: $y = -6x - 2$
 $12x + 2y = -6$

61) Solve the linear system: $4x + 3y = 27$
 $4x - 3y = -27$

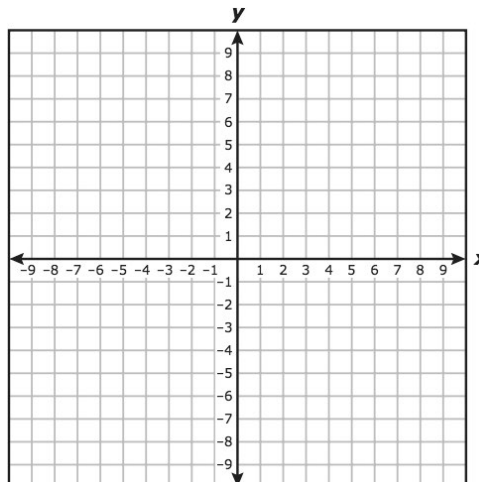
62) Solve the linear system: $9x - 7y = 31$
 $-9x + 3y = -39$

G. Graph Quadratics.

63) Graph: $y = x^2 + 5$



64) Graph: $x^2 - 2x = 3$



H. Factor/Solve Quadratics

65) Solve: $2x^2 = 8$ _____

66) Solve by factoring: $2x^2 + 8x = 0$ _____

67) Use the vertical motion model ($h = -16t^2 + vt + s$) to solve: A startled armadillo jumps straight into the air with an initial velocity of 14 feet per second. After how many seconds does it land on the ground?

t = _____

68) Factor and solve: $x^2 + 3x + 2 = 0$ _____

69) Use the quadratic formula to solve: $2x^2 + 9x + 7 = 3$ _____