Algebra 1: Semester Exam 2 Study Guide **Name** _____

1. What is the solution for the linear system of equations?

$$y = 3x + 5$$
$$y = 2x + 20$$

2. Solve this system of equations using substitution.

$$x = -7y + 34$$
$$x + 7y = 32$$

3. Which graph represents the solution for the linear system of equations?

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

4. Use elimination to solve the system of equations.

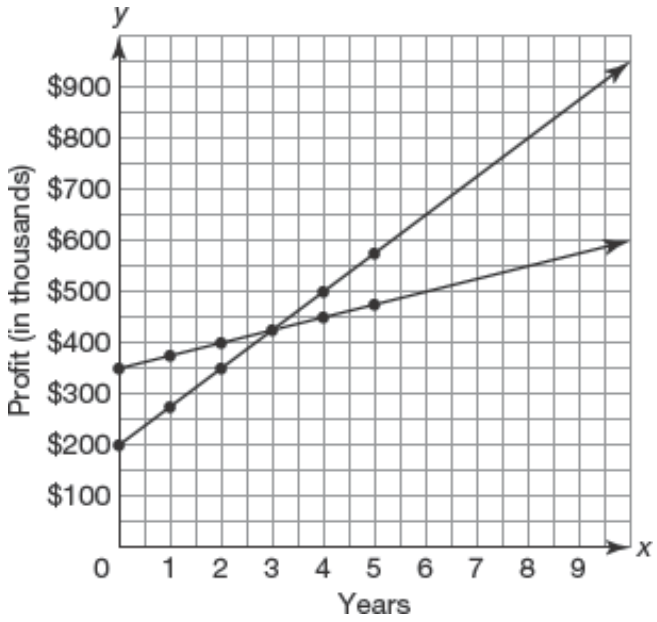
$$2x + 5y = 17$$
$$6x - 5y = -9$$

5. Solve this system of equations using elimination.

$$3x + 4y = 18$$
$$6x - 2y = 6$$

6. Music Central offers a $6 membership and charges $4 for each downloaded song. Save Music charges $12 for its membership and an additional $1 per song. How many songs must Grant download so the cost is the same for both companies

7. What is the break-even point for the graph?



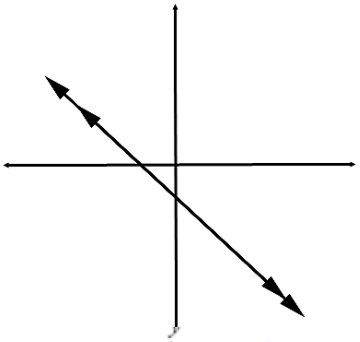
8. Curb Side Taxi charges a flat rate of $2.25 plus $0.50 per mile. Taxi-4-You charges a flat rate of $1.25 plus $0.75 per mile. Write a system of equations to represent each option.

A.
$$\begin{cases} y = 2.25 + 0.5x \\ y = 1.25 + 0.75x \end{cases}$$

B.
$$\begin{cases} y = 2.25x + 0.5 \\ y = 1.25x + 0.75 \end{cases}$$

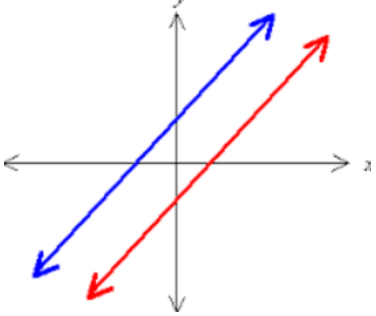
For 15 – 17, choose how many solutions the system of equations has.

9.



A. One solution
B. No solution
C. Infinite solutions

10.



A. One solution
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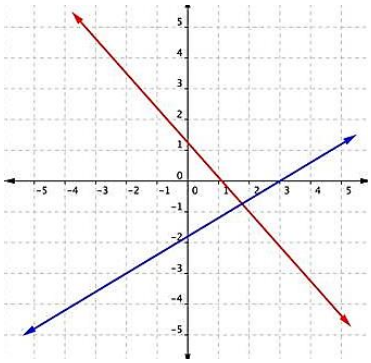
11.



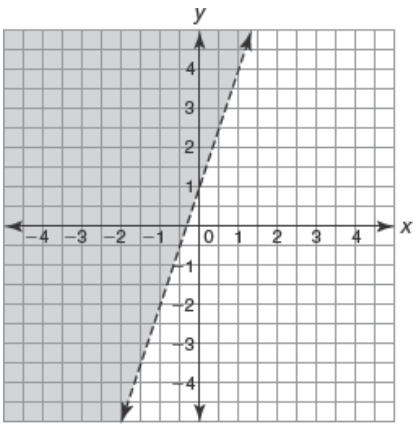
A. One solution
B. No solution
C. Infinite solutions

12. Marli has $1500 in her savings account. She withdraws $110 each month, where x represents the number of months. Write an equation for this situation.

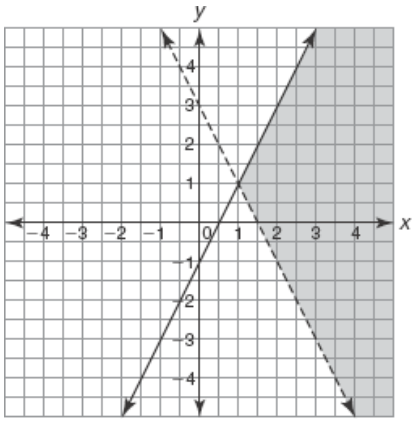
13. Which inequality has a graph with a dotted/dashed line?

A. $y \geq 15 - 5x$
B. $y \geq 11 + 4x$
C. $y < 12 + 3x$
D. $y \leq 16 - 2x$

14. Which inequality is represented by the graph?



15. Which system of linear inequalities is represented by the graph?

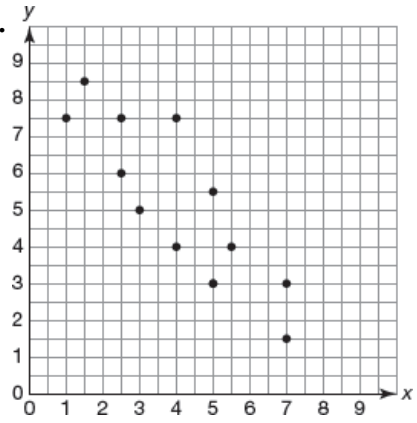


16. Write a system of equations representing the following situation?

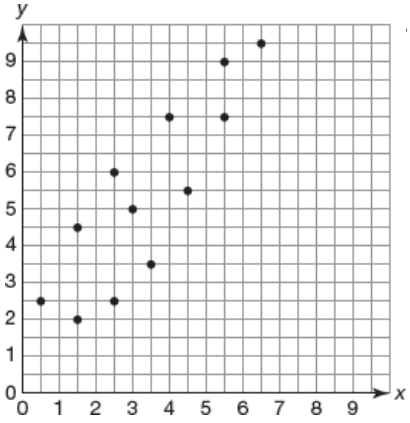
Brady will bike and jog for **no more than** 60 minutes.
He bikes 0.4 mph and jogs 0.1 mph, and he wants to go **at least** 12 miles.

17. Which graph most clearly shows a positive correlation?

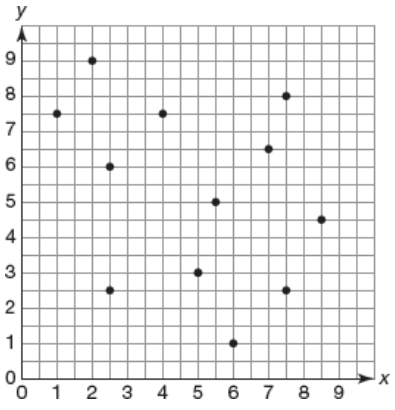
A.



B.



C.

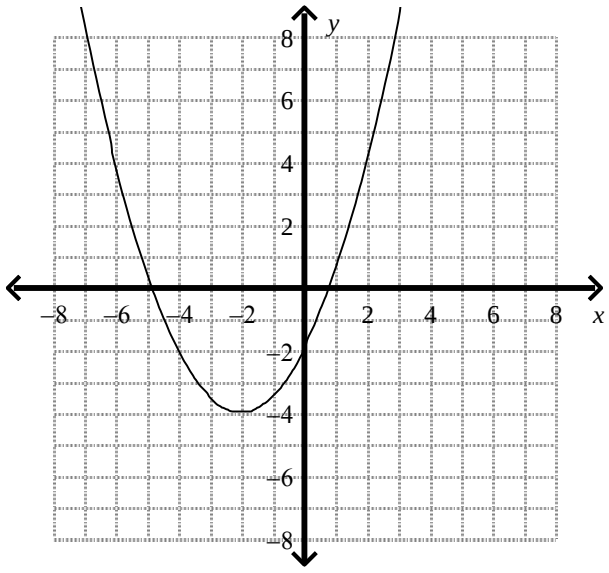


18. Which of these functions has a *y*-intercept of (0, 7)?

A. $f(x) = x^2 + 2x + 7$
B. $f(x) = 7x^2 - 3x + 1$
C. $f(x) = 7(x - 1)(x + 5)$
D. $f(x) = 3x(x - 7)$

19. A parabola consists of the *x*-intercepts: $(3, -2)$ and $(7, -2)$. What is the axis of symmetry?

Use the graph to the right for 26 – 27.



20. What is the domain?

21. What is the range?

22. Which equation represents a parabola that opens upward and has *x*-intercepts at (4, 0) and $(-6, 0)$?

23. How does the graph of $f(x) = -(x-5)^2 + 3$ compare to the graph of $f(x) = x^2$?

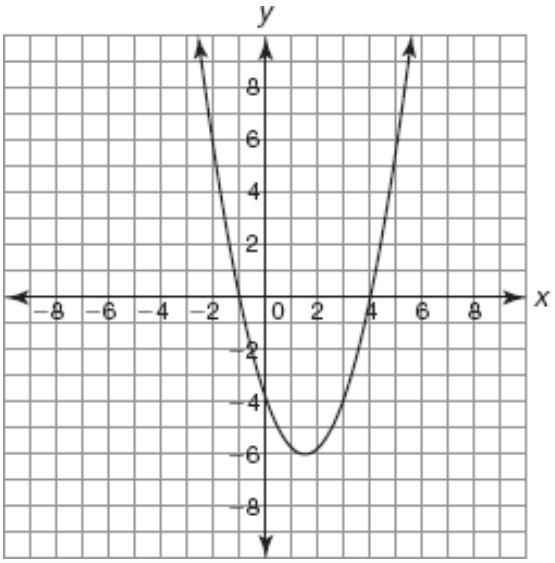
24. Which equation represents a parabola with zeros or *x*-intercepts at (7, 0) and (-3, 0)?

25. What is the vertex of the parabola $f(x) = x^2 - 2x - 8$ if the axis of symmetry is $x = 1$?

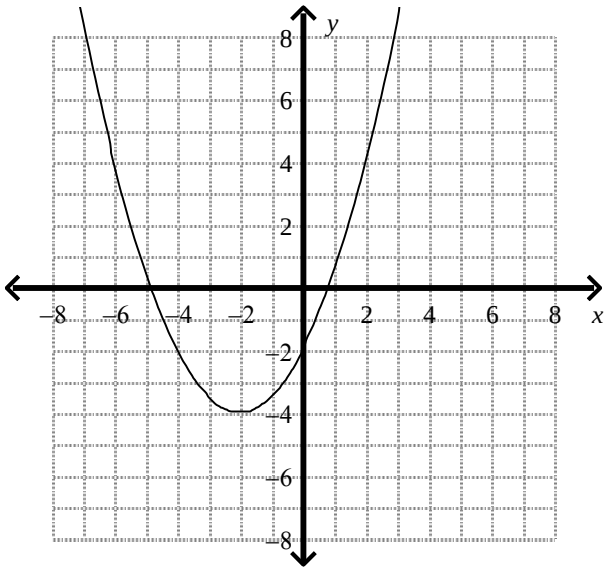
26. Which equation represents a parabola with a vertex at $(7, -3)$?

27. What is the vertex of the parabola $f(x) = x^2 + 5$ if the axis of symmetry is x = 0?

28. How is this graph different from the graph of the basic quadratic function $f(x) = x^2$?



29. What are the coordinates of the vertex of the graph? Is it a maximum or minimum?



30. Which function represents a parabola that is translated 2 units to the left and 6 units down from the function $f(x) = x^2$?

31. Subtract the two polynomial expressions. $(3x^2 + 8x + 6) - (2x^2 + 5x - 2)$

32. Add the two polynomial expressions. $(2x^4 - 3x) + (3x^3 + 7x + 3)$

33. What is the greatest common factor of the polynomial? (Hint: What can we divide out?) $6x^2 + 9$

34. Multiply using FOIL, the Distributive Property or a multiplication table. $(2x - 9)(5x + 6)$

35. Multiply using the Distributive Property or a multiplication table. $(x + 5)(4x^2 - 3x - 4)$

36. Simplify. $4x(3x + 8)$

37. Use the multiplication table to find the product of the polynomials.

A. $36x^2 - 3x - 14$
B. $36x^2 - 24x - 14$
C. $36x^2 - 21x - 14$
D. $36x^2 - 45x - 14$

·	$3x$	-2
$12x$	$36x^2$	$-24x$
7	$21x$	-14

38. Factor: $d^2 + 9d + 14$

39. Factor: $x^2 - x - 56$

41. Solve the polynomial by factoring. $x^2 - 25$

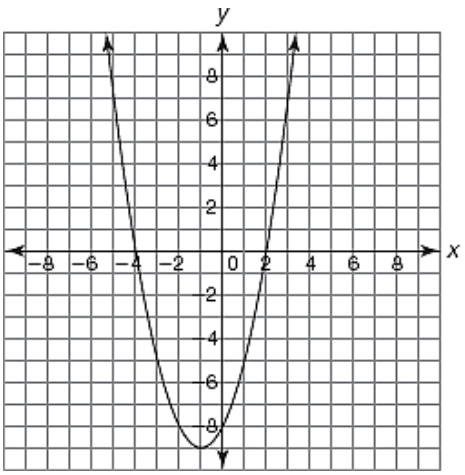
42. Solve the polynomial by factoring. $x^2 - 16 = 0$

Factor each of the following polynomials. Then, find the solutions.

43. $\boldsymbol{f(x) = x^2 - 14x + 49}$

44. $\boldsymbol{f(x) = x^2 + 6x + 8}$

45. Which polynomial does the graph represent?



46. What are the zeros of the quadratic equation: $2x^2 - 7x - 4 = 0$?

47. Use the quadratic formula to find the roots of the quadratic equation. $2x^2 - 7x - 4 = 0$ $x = \dfrac{-b \pm \sqrt{(b)^2 - 4ac}}{2a}$

48. Use the quadratic formula to find the roots of the quadratic equation:. $d^2 - 26d - 25$

49. What do the solutions (or zeros) represent for a quadratic function?

What is the simplified form of each expression?

50. $(9.2)^0$

51. $\frac{8t^{-4}}{d}$

52. $x^8 \cdot 2y^{10} \cdot 5x^5$

.

53. $(n^2)^7$

54. $\frac{m^5}{m^2}$

55. $\left(\frac{b}{7}\right)^2$