

Name _____

Due: Wednesday, September 4th

Algebra 2 Honors Summer Assignment

You are responsible to know all the material on this review upon entering Algebra 2. You should use your notes from Algebra 1 and additional resources to make sure it is completed fully and correctly. You will be assessed on this material within the first few weeks of the school year.

Complete all questions **without a calculator.**

Evaluate the expression.

1. $-2 + \left[4 \cdot 7 - 5 \left(9 - \frac{8}{2} \right) \right]$

2. $\frac{5+7}{3} - 6[12 - (17 - 2 \cdot 3)]$

3. $\left(3 + \frac{1}{4} \right) \left(1 - \frac{2}{3} \right)$

4. $\frac{2 - \frac{3}{4}}{\frac{1}{2} - \frac{1}{3}}$

5. Evaluate the function $f(x) = x^3 - 4x^2$ at the indicated values.

a. $f(-1)$

b. $f(2)$

c. $f\left(\frac{x}{2}\right)$

d. $f(x^2)$

Solve each absolute value equation.

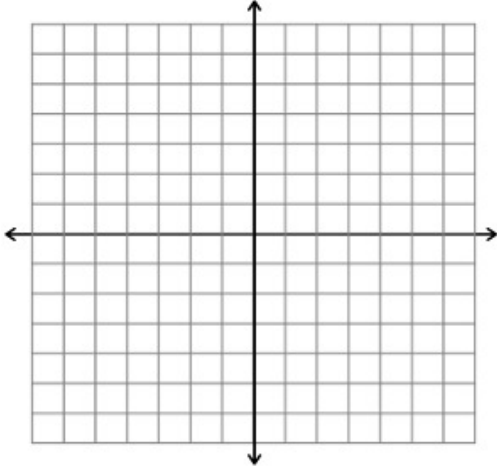
6. $|5x - 7| - 18 = 16$

7. $3|x + 24| = 21x$

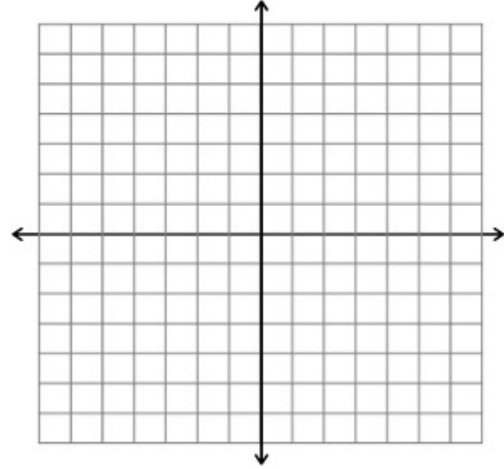
8. $|4x - 1| = 2x + 9$

Graph each absolute value function.

9. $y = |x - 2| + 5$



10. $f(x) = -\frac{1}{4}|x|$



Solve each linear equation or inequality.

11. $4 - 7(2x - 5) = 10$

12. $\frac{2}{3}y + \frac{1}{2}(y - 3) = \frac{y + 1}{4}$

13. $r - 2[1 - 3(2r + 4)] = 61$

14. $\frac{3}{x + 1} = \frac{9}{4x + 5}$

15. $3(2f - 1) \geq 6(f + 2)$

16. $3(5 + 2x) - 9x > 3$

Solve each equation for the indicated variable.

17. $5t - 2r = 25$ for t

18. $4y - xy = 28$ for y

Write the equation in slope-intercept form of each linear function.

19. Passes through $(-1,6)$ and has slope of 4.

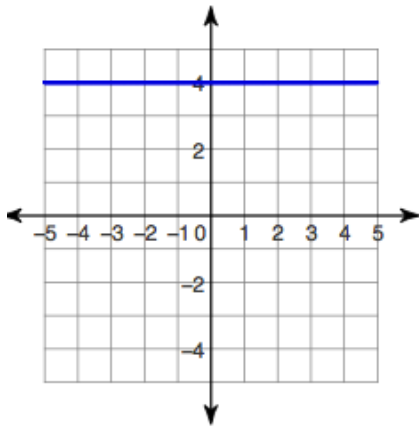
20. Passes through $(0,-2)$ and is parallel to the line $y = \frac{1}{4}x + 7$.

21. Passes through the point $(4,-2)$ and is perpendicular to the line $2y + 2 = 6x$.

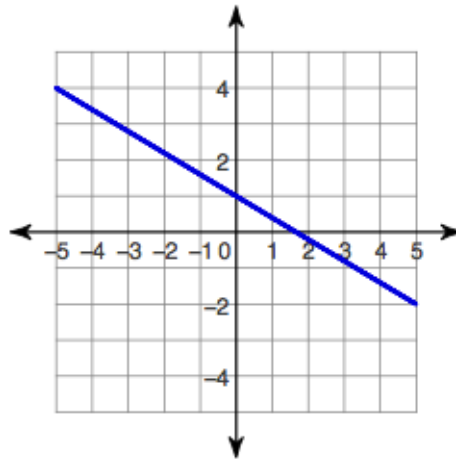
22. Passes through the points $(-2,5)$ and $(4,-7)$.

Write the equation in slope-intercept form of the line shown.

23.



24.

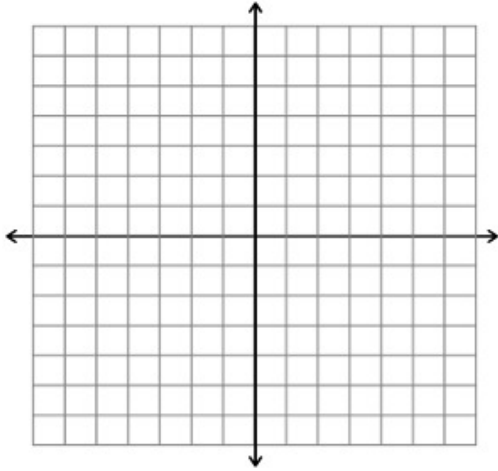


25. Suppose that the body length in inches, y , of a fast-growing calf x months after birth is modeled by $y = 6x + 48$, where $0 \leq x \leq 36$.

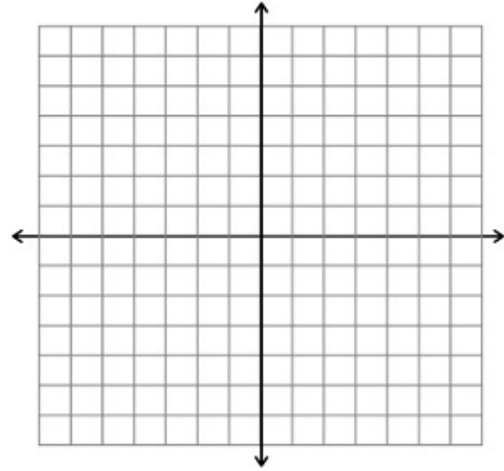
- Describe what the slope and y-intercept represent in this situation.
- Estimate the body length of a calf that is 10 months old.
- After how many months will the calf be 20 feet long?

Graph each linear function or inequality.

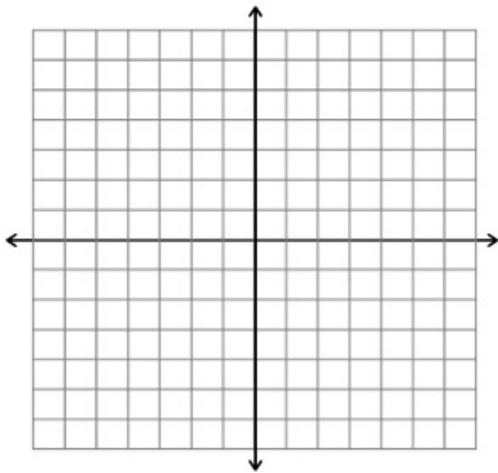
26. $\frac{1}{2}x + 2y = -2$



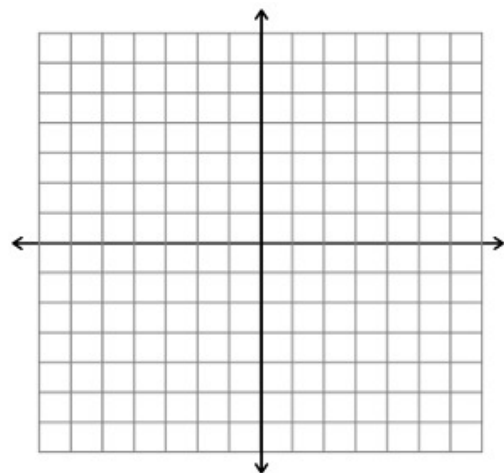
27. $x = 2$



28. $y \geq -\frac{1}{2}x - 3$



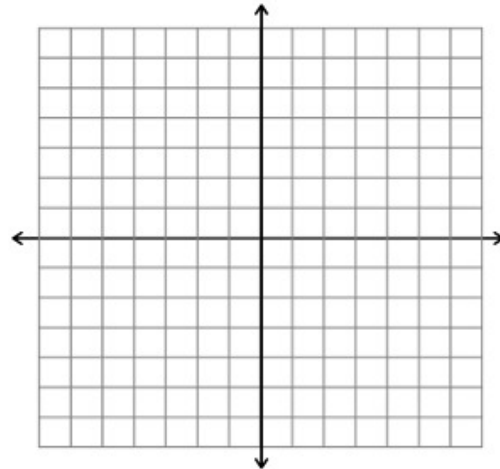
29. $x + 4y < 12$



30. Solve the system by graphing.

$$3x + 3y = 12$$

$$12 = 5x - 3y$$



Solve each system using substitution.

31. $6x - 2y = 8$

$$y = 3x - 4$$

32. $y = 3x - 8$

$$y = -4x + 7$$

Solve each system using elimination.

33. $7x + 2y = -1$
 $4x - 3y = -13$

34. $4x + y = 1$
 $4x + y = -2$

Write a system of equations to model the situation and solve using any algebraic method.

35. A soccer league offers two options for membership plans. Option *A* includes an initial fee of \$40 and costs \$5 for each game played. Option *B* costs \$10 for each game played. After how many games will the total cost of the two options be the same?

36. Your long-distance telephone plan charges 8 cents per minute for weekday, daytime calls, and 5 cents per minute for night and weekend calls. If you made a total of 220 minutes of long-distance calls during one billing cycle and your bill was \$13.16 not including taxes and fees, how many minutes of night and weekend calls did you make?

Simplify. Your answer should contain only positive exponents.

$$37. \left(\frac{3x^4}{4y^2}\right)^3$$

$$38. (2z^2)^{-5}z^{10}$$

$$39. \frac{(c^4)^3}{4} \cdot \frac{12d^{-6}}{(15cd)^{-1}}$$

$$40. \frac{8a^3b^{-4}}{2a^{-5}b^5}$$

$$41. (2s^3t^{-8})\left(\frac{1}{4}s^7t\right)(16s^0t^4)$$

$$42. \left(\frac{y}{5x^{-2}}\right)^{-3}$$

Simplify each radical expression.

$$43. \sqrt{98}$$

$$44. 3\sqrt{3} - 3\sqrt{75} - 4\sqrt{27}$$

$$45. 2\sqrt{48}$$

$$46. (2\sqrt{5})(3\sqrt{125})$$

$$47. \frac{3}{\sqrt{12}}$$

$$48. \frac{4}{2+\sqrt{3}}$$

Solve each equation.

$$49. 6x^2 - 7x - 4 = 0$$

$$50. 81x^2 - 225 = 0$$

$$51. x^4 - 21x^2 - 100 = 0$$

$$52. 4\sqrt{7x-1} + 5 = 13$$

$$53. 32x^4 - 68x^2 - 30x^2 = 0$$

$$54. 7(8x-6)^2 + 19 = 12$$

$$55. 10b^2 + 1 = 451$$

$$56. 3x^2 - 123 = 12x$$

$$57. 4x(5x+4) = 21 - 7x$$

58. $x+1=\sqrt{7x+15}$

59. $24x^2+8x+2=5-6x$

60. $\frac{2}{3}(x+8)^2-66=0$

Factor each expression completely.

61. $(z+2)^2-5(z+2)$

62. $(3x+2)^2+8(3x+2)+12$

63. $4x^2+4xy+y^2$

64. $n(x-y)+(n-1)(y-x)$

65. $2x^3-6x^2-32x+96$

66. $18a^5b-32a^3b^3$

Multiply.

67. $(x-5)(x+1)(x+3)$

68. $(x^3-2x+1)(x^3+x^2-5)$

69. $(3t-5)^2$

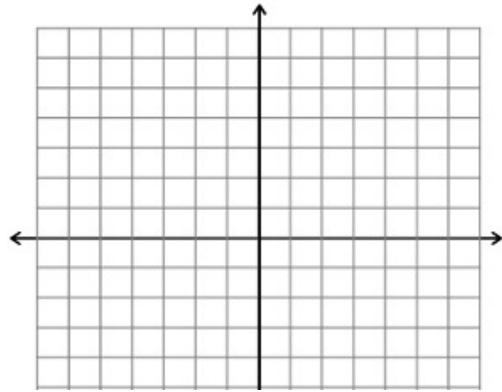
Find the discriminant of the quadratic equation and give the number and type of solutions of the equation.

70. $7r^2-5=2r+9r^2$

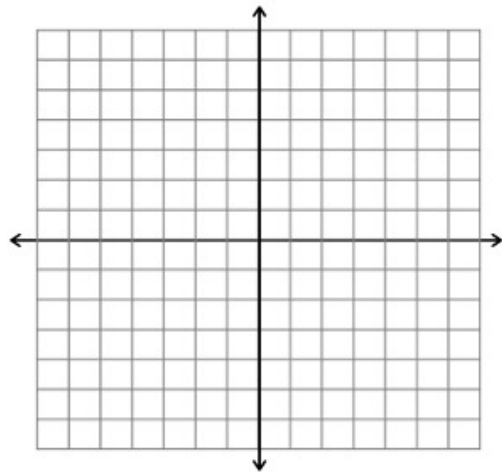
71. $x^2-4x+32=12x-x^2$

For each quadratic function below (a) state the vertex and axis of symmetry, (b) find the zeros using any method, (c) state the minimum or maximum value, (d) graph, and (e) state the domain and range.

72. $f(x) = x^2 + 6x + 8$



73. $y = -2x^2 + 8x - 1$



74. A rocket carrying fireworks is launched from a hill 80 feet above a lake. The rocket will fall into the lake after exploding at its maximum height. The rocket's height h (in feet) above the surface of the lake after t seconds is given by $h = -16t^2 + 64t + 80$.

- a) What is the height of the rocket after 1.5 seconds?

- b) What is the maximum height reached by the rocket? How long does it take the rocket to reach its maximum height?

- c) How long will it take for the rocket to hit 128 feet?

d) After how many seconds after it is launched will the rocket hit the lake?