

2017 Algebra 2 Fall Final Exam Review

1.1 Expressions & Formulas

Evaluate each expression if $x = -3$ and $y = -4$

1. $7x^2 - (x + y)^2$

2. $|y - 2x|$

1.2 Properties of Real Numbers

Find the Additive and Multiplicative inverse for each number.

3. -6

4. $\frac{3}{4}$

1.3 Solving Equations

Write an algebraic expression from the given verbal expression.

5. The difference between 4 and the product of 5 and a number.

6. Five more than the quotient of a number and 4.

Solve each equation for the given variable.

7. $53 = 3(d-2) - 2(3d-1)$

8. $8(m+7) = 6m - 8 + 2m$

1.4 Solving Absolute Value Equations

Solve each equation.

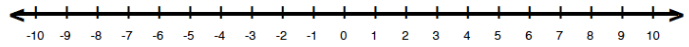
9. $\frac{|x+4|}{2} + 6 = 14$

10. $-3 \left| \frac{1}{2}m - 7 \right| = -9$

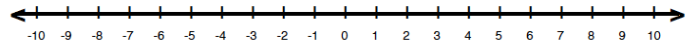
1.5- 1.6 Solving Inequalities.

Solve each inequality and graph the solution set on a number line.

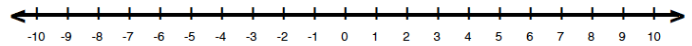
11. $-7 \leq 2x - 5 < 7$



12. $-3|x + 4| > -6$



13. $|4x - 2| \geq 6$



Chapter 2

2.1 domain & range

Find the domain and range of each relation and determine if it is a function.

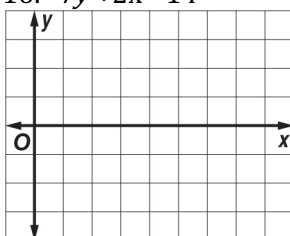
14. $\{(-2, 2), (0, -4), (0, 3), (1, 2), (2, 3)\}$

15. $\{(0, 2), (1, 4), (3, 3), (5, 2), (7, 3)\}$

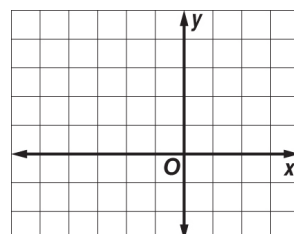
2.2 linear functions

Graph each line using the x & y intercepts.

16. $7y + 2x = 14$



17. $2.5x - 5y + 7.5 = 0$



2.3 Rate of Change and Slope

18. Find the rate of change in the balloon's altitude between 3 and 11 minutes into the flight.

Time (minutes)	Altitude of balloon (meters)
3	520
8	1,220
11	1,640
15	2,200
23	3,320

2.4 Writing Equations of lines

Write an equation in slope-intercept form for the line described.

19. Passing through (-2,1) and perpendicular to $y = 4x + 11$

20. Passing through (6,1) and is parallel to the line with the equation $5x - 3y = -15$.

2.6 Piecewise functions

Evaluate the piecewise functions for each given value.

21.
$$f(x) = \begin{cases} 5, & \text{if } x \leq -6 \\ -9, & \text{if } -6 < x < 6 \\ 0, & \text{if } x \geq 6 \end{cases}$$

a. $f(0) =$

b. $f(6) =$

22.
$$f(x) = \begin{cases} 3x + 2, & \text{if } x < -2 \\ -x^2 + 5, & \text{if } -2 \leq x \leq 5 \\ |x - 7|, & \text{if } x > 5 \end{cases}$$

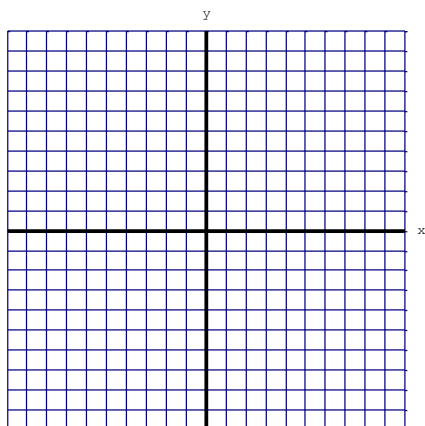
a. $f(9) =$

b. $f(-4) =$

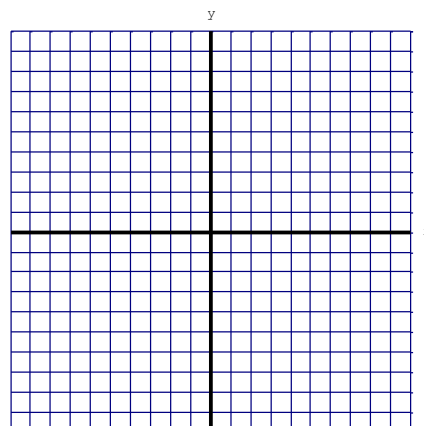
2.7 Transformations

Identify the parent function and transformations. Then graph using the function.

23. $f(x) = 2(x+3)^2 - 3$



24. $f(x) = -\frac{1}{2}|x-1|+5$



25. Let $g(x)$ be a horizontal translation left 2 units followed by a vertical translation up 5 units of the function $f(x) = 3(x-4)^2 - 2$. Write the rule for $g(x)$.

26. Let $g(x)$ be a vertical reflection followed by a vertical translation down 3 units of the parent function $(x) = x^2$. Write the rule for $g(x)$.

Chapter 3

3.1 Solving Systems by elimination & substitution

27. Use substitution to solve the system $\begin{cases} 3x + y = -3 \\ y = x + 5 \end{cases}$.

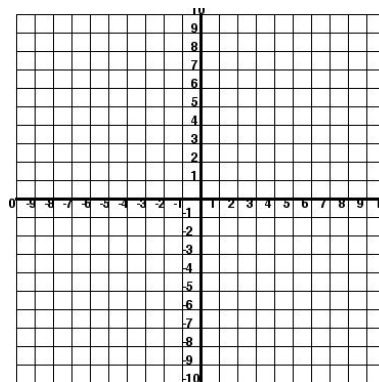
28. Use elimination to solve the system $\begin{cases} 3x - 3y = 9 \\ x + 3y = 7 \end{cases}$.

29. When solving the given system of equations using elimination, Kathryn multiplied the first equation of the system by 2. By what number would she multiply the second equation to eliminate the y variable if she was using addition?

$$\begin{aligned} 4x - 3y &= 6 \\ 6x + 1y &= 10 \end{aligned}$$

3.2 Solving systems of inequalities by graphing

30. Graph the system of inequalities $\begin{cases} y < -3x + 2 \\ y \geq 4x - 1 \end{cases}$.



Section 3.5 Sums, differences and scalar multipliers of matrices

31. If $C = \begin{bmatrix} -1 & 8 \\ 2 & 3 \end{bmatrix}$ and $D = \begin{bmatrix} -3 & -6 \\ 8 & 1 \end{bmatrix}$, find $3D - 2C$.

3.6 Multiplying matrices

32. Evaluate the matrix expressions CD and DC .

$$C = \begin{bmatrix} 6 \\ -2 \\ -5 \end{bmatrix} \quad D = \begin{bmatrix} 3 & -2 & 1 \\ -6 & 2 & 0 \end{bmatrix}$$

33. If $A = \begin{bmatrix} 2 & -3 \\ -1 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} x \\ y \end{bmatrix}$ find AB

34. What are the dimensions of A ? What are the dimensions of B ?

$$A = \begin{bmatrix} 2 & -1 & 0 & 2 \\ -3 & 6 & 8 & 2 \\ 0 & -3 & -5 & 7 \end{bmatrix} \quad B = \begin{bmatrix} 2 & 0 \\ -1 & 3 \\ 7 & -2 \\ 0 & -4 \\ 1 & -2 \end{bmatrix}$$

$a_{23} =$ _____ What is the result of the equation $a_{32}(a_{13} - a_{33} \times a_{24})$?

3.8 Solving Systems of Equations with Matrices.

Write out the matrix equation and then solve. Don't forget to put each equation in standard form first!

$$35. \quad \begin{cases} 5x = 8 + 3y \\ 6x - 4 = 5y \end{cases}$$

Chapter 4

4.1 Graphing Quadratic Functions

Identify the axis of symmetry and the vertex. State whether the graph opens up or down and give the maximum or minimum value.

36. $f(x) = -2x^2 + 8x + 5$

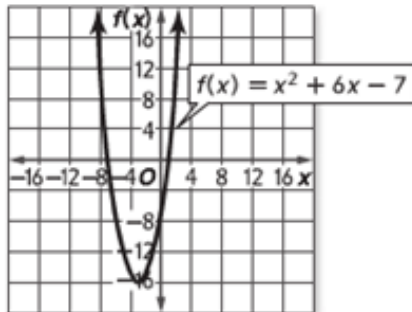
37. $g(x) = 3x^2 + 6x - 8$

4.2 Solving quadratic functions using tables and graphs.

38. Use the table to find the solution(s) of the quadratic equation. If exact roots cannot be found, state the consecutive integers between which the roots are located.

x	-3	-2	-1	0	1	2	3
$f(x)$	12	3	-6	-2	4	8	14

39. What are the apparent zeros of the function shown in the graph?



4.3 Solving Quadratics by factoring

Solve the following quadratic equations by factoring. You must show the factored form as well as the solutions (zeros)

40. $x^2 + 16x = -60$

41. $2x^2 - 3x - 5 = 0$

42. $25x^2 - 4 = 0$

4.4 Simplifying imaginary numbers and performing operations with complex numbers.

Perform the following math operations with complex and imaginary numbers.

43. $(7 + 6i) - (-3 + 8i)$

44. $(4i)(5i)$

45. $(2 + 3i)(2 - 3i)$

4.5 Solving Quadratics by Completing the Square

Solve the following quadratic equations by completing the square.

46. $x^2 - 8x = 9$

47. $x^2 + 4x - 5 = 0$

4.6 Solving Quadratics with the Quadratic Formulas

Solve the following quadratic equations by using the quadratic formula.

48. $4x^2 - 2x + 1 = 0$

49. $2x^2 + 9x - 5 = 0$