Name _____ Block _____ School_____

Algebra 2 DISTRICT COMMON ASSESSMENT 2

Directions: Show all work on this paper. When completed, transfer your answers online.

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1. Find each key feature of the function shown in the graph. Write the range and domain in interval notation, and assume all values are integers. **(Be careful of the scale on the graph when determining your answers.)**

   Range = _____

   Choose from the following. **Type carefully!**
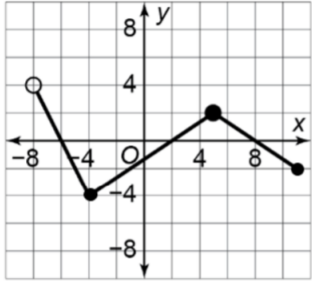
   (−4, 4]   [−4, 4)   (−4, 4)   [−4, 4]

   Domain = _____

   Choose from the following. **Type carefully!**
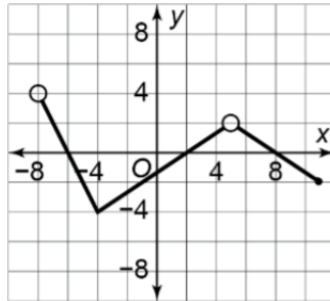
   (−8, 11]   [−8, 11)   (−8, 11)   [−8, 11]

   Is the function positive or negative over the interval (−8, −6)? _____
   Choose from the following. **Type carefully in ALL lower case!**   positive   negative

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2. What is the average rate of change for the function over the interval [−6, −4]?
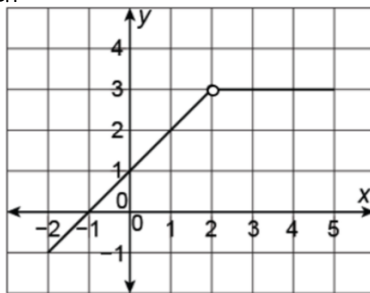

   a) 2
   b) −10
   c) −1
   d) −2

3. Identify the translations of the parent function $f(x) = x^2$ that result in $g(x) = (x + 2)^2 + 6$.

   a) Down 2 units, right 6 units
   b) Up 2 units, right 2 units
   c) Up 6 units, left 2 units
   d) Up 2 units, left 6 units

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4. Use the graph of the function f(x). For what value of x is the function undefined?

   a) x = −1
   b) x = 0
   c) x = 2
   d) x = 5

5. Which of the following sequences are arithmetic? **Select all that apply. There are two answers.**

   a) $\frac{1}{3}, \frac{1}{6}, \frac{1}{12}, \frac{1}{24}, \ldots$
   b) $\frac{1}{2}, 1, 2, 4, \ldots$
   c) $12, 7, 2, −3, \ldots$
   d) $3, 11, 19, 27, \ldots$

6. Write the first 4 terms of the sequence defined below.

   $$a_n = \begin{cases} −6, & \text{if } n = 1 \\ a_{n-1} + 5, & \text{if } n > 1 \end{cases}$$

   a) −6, −1, 5, 10
   b) −6, −30, −150, −750
   c) −6, −11, −16, −21
   d) −6, −1, 4, 9

7. In a concert hall, there are 16 chairs in the first row, and each row has four more chairs than the previous row. There are 14 rows altogether. How many chairs are there in the concert hall? **(You are looking for the sum of the chairs in the concert hall.)**

   a) 68
   b) 588
   c) 616
   d) 1,176

8. Use the graph to solve $-|x - 2| + 4 \leq 0$.
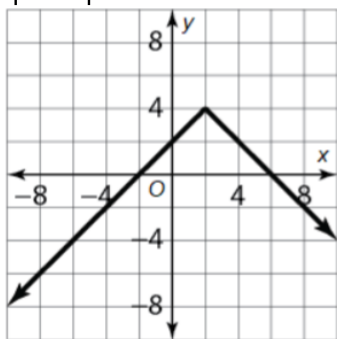
$x \leq$ _____

$x \geq$ _____

9. Solve the system of equations. **Enter the answers as improper fractions.**

$$\begin{cases} 2x + y = 1 \\ x + 2y = -6 \end{cases}$$

$x =$ _____

$y =$ _____

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10. What system of equations is represented by the matrix? $\begin{bmatrix} -1 & 4 & | & 0 \\ 2 & 9 & | & 1 \end{bmatrix}$

a) $\begin{aligned} -x + 4 &= 0 \\ x + 9 &= 1 \end{aligned}$

c) $\begin{aligned} -x + 4y &= 0 \\ 2x + 9y &= 1 \end{aligned}$

b) $\begin{aligned} -x + 4y &= 0 \\ x + 9y + z &= 0 \end{aligned}$

d) $\begin{aligned} -x + 4y &= 0 \\ 2x + 9y &= z \end{aligned}$

11. What is the reduced row echelon form for the matrix? $\begin{bmatrix} 2 & -2 & 2 & | & 4 \\ 0 & 1 & 1 & | & 8 \\ 0 & 0 & 5 & | & 5 \end{bmatrix}$

a) $\begin{bmatrix} 1 & 0 & 0 & | & 4 \\ 0 & 1 & 0 & | & 8 \\ 0 & 0 & 1 & | & 5 \end{bmatrix}$

c) $\begin{bmatrix} 1 & 0 & 0 & | & -6 \\ 0 & 1 & 0 & | & 7 \\ 0 & 0 & 1 & | & 1 \end{bmatrix}$

b) $\begin{bmatrix} 1 & 0 & 0 & | & 2 \\ 0 & 1 & 0 & | & 8 \\ 0 & 0 & 0 & | & 1 \end{bmatrix}$

d) $\begin{bmatrix} 1 & 0 & 0 & | & 8 \\ 0 & 1 & 0 & | & 7 \\ 0 & 0 & 1 & | & 1 \end{bmatrix}$

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12. What is the equation written in vertex form of a parabola with a vertex of $(4, -2)$ that passes through $(2, -14)$?

a) $y = -3(x - 4)^2 - 2$

b) $y = -3(x - 4)^2 + 2$

c) $y = 3(x - 4)^2 - 2$

d) $y = 3(x + 4)^2 + 2$

13. Function g is a transformation of the parent function $f(x) = x^2$. The graph g is a translation left 6 units and up 5 units of the graph of f. Write the equation for g in the form $y = ax^2 + bx + c$.
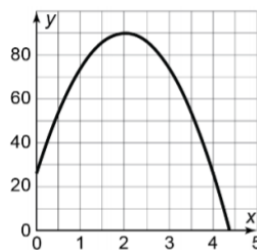
a) $g(x) = x^2 + 10x + 19$

b) $g(x) = x^2 - 10x + 19$

c) $g(x) = x^2 + 12x + 41$

d) $g(x) = x^2 - 12x + 41$

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14. The path of a projectile launched from a 26–ft tall tower is modeled by the equation

$y = -16t^2 + 64t + 26$. What is the maximum height, in feet, reached by the projectile?

The maximum height is ___ feet.

15. Solve the equation $-x^2 + 10x = -24$.

a) $x = 4$ and $x = 6$

b) $x = -4$ and $x = -6$

c) $x = 2$ and $x = -12$

d) $x = -2$ and $x = 12$

16. Identify the interval(s) on which the function
    $y = 2x^2 - 8x - 10$ is positive.
    (Hint: Graph the equation on your calculator.)

    a) $-1 < x < 5$
    b) $x < -1$ and $x > 5$
    c) $-5 < x < 1$
    d) $x < -5$ and $x > 1$

17. Use square roots to solve the equation $x^2 = -625$ over the complex numbers. **Select any solutions that apply.**

    a) $25i$
    b) $25i^2$
    c) $-25i$
    d) -25

18. Write the product $(6 - i)(6 + i)$ in the form $a + bi$, by simplifying completely.

    a) 37
    b) $36 - i^2$
    c) 35
    d) $12 - i^2$

19. Factor the expression $100x^2 + 49$.

    a) $(10x + 7)(10x - 7)$
    b) $(10x + 7i)(10x + 7i)$
    c) $(10x + 7i)(10x - 7i)$
    d) $(10x + 7i)(x + 7i)$

20. A function is defined by the equation $y = 2x^2 + 12x + 24$. Which statements are true? **Select all that apply. (Careful, more than two may be correct.)**

    a) The equation written in vertex form is $y = 2(x + 3)^2 + 6$.
    b) The equation written in vertex form is $y = 2(x + 3)^2 + 24$.
    c) The graph of the function has a minimum of $y = 6$ at $x = -3$.
    d) The domain of the function is all real numbers.