Study guide Unit 3 - Functions - 2nd block 2015-2016

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Name: _____ **Date:** _____

Show ALL work (where applicable) for full credit.

1. Which of the following is always true for all functions?

   I. Zero cannot be in the domain.

   II. For every x there is only one y.

   III. For every y there is only one x.

   A. I only
   B. II only
   C. III only
   D. I and III only

2. This equation represents what type of function?

   $y = 3x^2 - 5$

   A. linear
   B. quadratic
   C. absolute value
   D. cubic

3. What is the domain of the given relation?

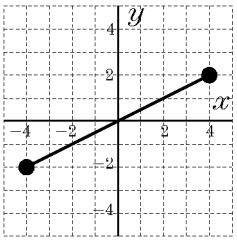
   $\{(2, 2),\ (3, 2),\ (2, 3),\ (1, 4)\}$

   A. $\{2, 3, 4\}$
   B. $\{1, 2, 3\}$
   C. $\{1, 4\}$
   D. $\{2, 3\}$

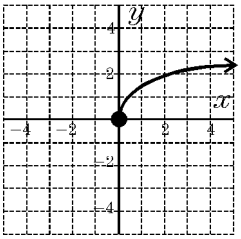
4. State the domain and range of the function $y = -3x - 2$. **Note:** $x \in \mathbb{R}$ means $x \in (-\infty, \infty)$

   A. $x \in \mathbb{R}$ and $y \in \mathbb{R}$
   B. $x \in \mathbb{R}$ and $y > 0$
   C. $x \neq 0$ and $y \neq 0$
   D. $x \in \mathbb{R}$ and $y > -2$

5. State the domain of the function.



   A. $x \geq -4$
   B. $-2 \leq x \leq 2$
   C. $-4 \leq x \leq 4$
   D. $\{-4, -3, -2, -1, 0, 1, 2, 3, 4\}$

6. 

   What is the domain of the function shown?

   A. $x \geq 0$
   B. $y \geq 0$
   C. $y \leq 0$
   D. all real numbers

7. What is the range of the function

   $f(x) = 2x + 3$

   when the domain is $\{-3, -1, 1\}$?

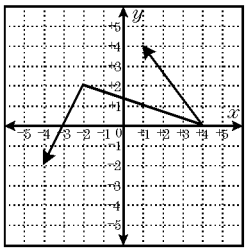
   A. $\{0, 2, 4\}$
   B. $\{9, 5, 3\}$
   C. $\{3, -1, -5\}$
   D. $\{-3, 1, 5\}$

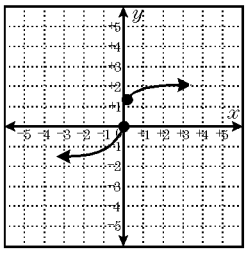
8. This equation represents what type of function?

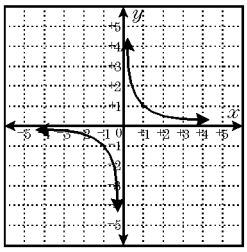
$y = |x - 4| + 2$

A. quadratic
B. exponential
C. absolute value
D. cubic

9. Which of the following graphs is a function?

A.


B.


C.


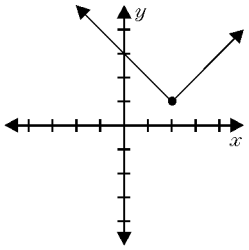
D. none of these

10. Which of the following is a quadratic function?

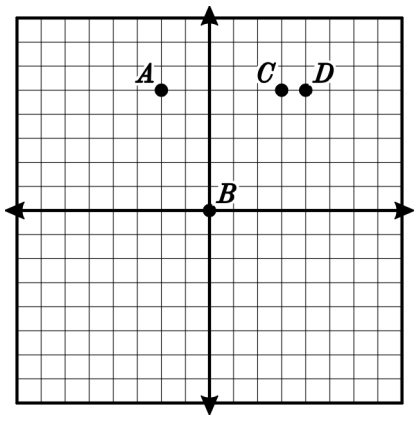
A. $f(x) = 3x^4 - 2x^2 + 7$
B. $f(x) = 3x - 5$
C. $f(x) = 2x^2 - 3x + 6$
D. $f(x) = 3$

11. Given the graph, describe the domain.

A. $x \geq 1$
B. $y \geq 1$
C. $x < 2$
D. All Real Numbers



12. What is a reasonable domain for the relation graphed below?



A. $[-2, 4]$
B. $[-1, 5]$
C. $\{-2, 0, 3, 4\}$
D. $\{-1, 0, 5\}$

13. Find $f(x) - g(x)$, given $f(x) = 2x^2 - 3x + 1$ and $g(x) = x^2 + 10x + 5$.

A. $x^2 - 13x - 4$
B. $7x^2 + 24x + 17$
C. $x^2 + 30x - 13$
D. $x^2 - 36x - 17$

14. Let $f(x) = \sqrt{x}$, $g(x) = 2\sqrt{x-4} + 6$. Describe $g(x)$ in terms of the parent function, $f(x)$.

$g(x)$ is $f(x)$:

A. vertical shrink, translated left 4 and up 6
B. vertical stretch, translated right 4 and up 6
C. horizontal stretch, translated right 6 and down 4
D. horizontal shrink, translated right 4 and up 6

15. Compared to its "parent" function $f(x) = x^2$, what effect will we see in the graph of $f(x) + 7$?

A. translated 7 units left

B. translated 7 units right

C. translated 7 units up

D. translated 7 units down

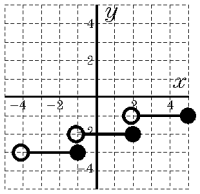
16. What is the range of the graphed function?

A. $-1, -2, -3$

B. $-4, -1, 2, 5$

C. $-3 \le y \le -1$

D. $-4 \le x < 5$



17. Consider the equation $y = |x|$. What effect will replacing x with $x + 7$ have on the graph?

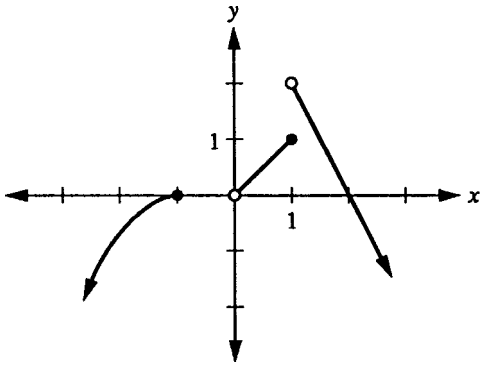
A. slides the graph 7 units left

B. slides the graph 7 units up

C. slides the graph 7 units down

D. shrinks the graph by a factor of 7

18.



Given the graph, find the domain, range, and interval of increasing, decreasing and constant

19. If the graph of $y = x^2$ is translated 3 units to the left and 4 units up, what is its equation? Graph the parent function and its translation.

20. If the graph of $y = \sqrt{x}$ is translated 2 units to the left, 5 units down, and then flipped over the x-axis, what would be the resulting equation? Graph the parent function and its translation.

21. The graph of $y = |x|$ is translated 3 units to the left and 4 units down. What is the resulting equation? Graph the parent function and its translation.

22. Graph $f(x) = \begin{cases} -3 & \text{if } x < 0 \\ -1 & \text{if } x = 0 \\ x & \text{if } x > 0 \end{cases}$