Name_____

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MATH@TD

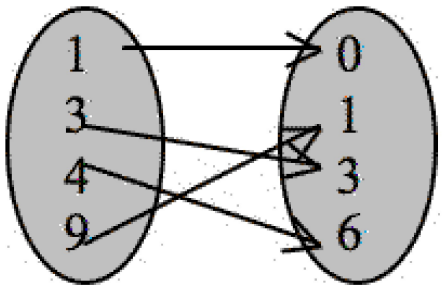
11U - U2: Intro to Functions - Domain and Range practice

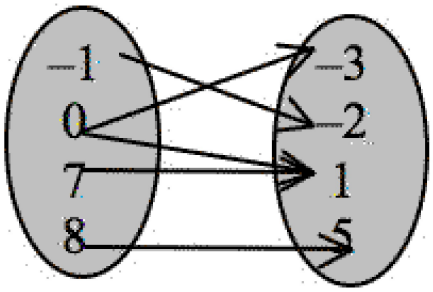
Multiple Choice
*Identify the choice that best completes the statement or answers the question. Circle the letter of your choice **AND** write the leter beside the question number.*

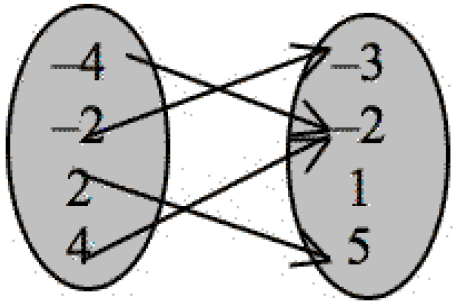
1. Consider the functions $f(x) = -(x^2) + 6x$ and $g(x) = x^2 - 9x + 1$. Which of the following is true?
   a. $f(-3) > g(-3)$
   b. $f(0) = g(0)$
   c. $f(4) < g(4)$
   d. $f(-2) < g(-2)$

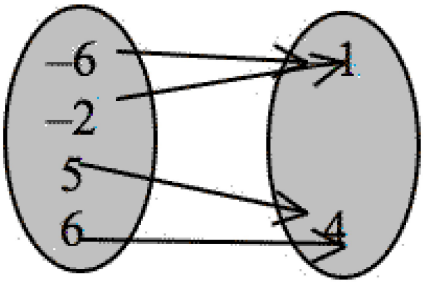
2. Evaluate $f(x) = -4x^2 + 7$ for $f(1) + f(-2)$.
   a. –6
   b. 3
   c. 26
   d. 94

3. What are the domain and range of the function $f(x) = \sqrt{x-5}$?
   a. Domain = $\{x \in \mathbf{R}\}$
      Range = $\{y \in \mathbf{R}\}$
   b. Domain = $\{x \in \mathbf{R} \mid x \geq 0\}$
      Range = $\{y \in \mathbf{R} \mid y \geq 0\}$
   c. Domain = $\{x \in \mathbf{R} \mid x \geq 25\}$
      Range = $\{y \in \mathbf{R} \mid y \geq 1\}$
   d. Domain = $\{x \in \mathbf{R} \mid x \geq 5\}$
      Range = $\{y \in \mathbf{R} \mid y \geq 0\}$

4. Which of the following relations is not a function?
   a. 

   c. 

   b. 

   d. 

5. Which relation is a function?
   a. {(–3, –2), (–1, 3), (0, –2), (3, 4)}
   b. {(0, 1), (3, 2), (5, –3), (0, 2)}
   c. {(–7, –7), (–2, 5), (–1, 6), (–2, –5)}
   d. {(–4, –7), (–9, 5), (4, –2), (–9, 0)}

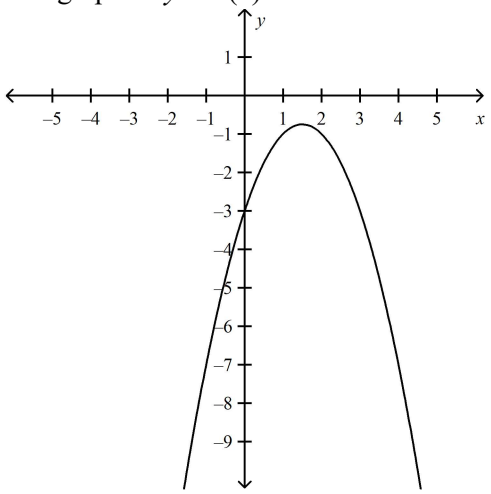
6. Which of the following relations is not a function?
   a. The relation between height and time if a tree grows 4 cm/yr
   b. The relation between money earned and time if interest for a bank account is 5% per month
   c. The relation between distance and time if a car travels 85 km/h
   d. The relation between students' ages and points scored on a test

7. Which relation is a function?

   a. $2x^2 - 5y^2 = -24$
   b. $y = 2x^2 - 3x + 7$
   c. $\frac{x^2}{4} - \frac{y^2}{9} = 1$
   d. $y^2 = -x + 3y$

8. Which relation is not a function?
   a. {(–13, –10), (–15, –12), (–11, –8), (–16, 4)}
   b. {(8, 17), (5, 5), (8, –3), (4, –1)}
   c. {(–14, –2), (–10, 6), (–1, 3), (10, 6)}
   d. {(0, –2), (–4, 6), (4, 15), (12, 6)}

9. The graph of $y = h(x)$ is shown.



   Evaluate $h(-1) + h(4)$.
   a. –14
   b. –12
   c. –3
   d. 0

10. What are the domain and range of the relation?

Year	Population
1990	4965
1995	5199
2000	5874
2005	5821

   a. Domain = {1990 ≤ x ≤ 2005}
      Range = {4965 ≤ y ≤ 5874}
   b. Domain = {1990, 1995, 2000, 2005}
      Range = {4965, 5199, 5821, 5874}
   c. Domain = {$x \in \mathbf{R}$}
      Range = {$y \in \mathbf{R}$}
   d. Domain = {1990, 2005}
      Range = {4965, 5874}

11. What are the domain and range of the relation that contains the points {(–16, –10), (–14, –8), (–11, –3), (–7, 4), (–1, –8)}?
    a. Domain = {–16, –14, –11, –10, –8, –7, –3, –1, 4}
       Range = {–16, –14, –11, –10, –8, –7, –3, –1, 4}
    b. Domain = {–10, –8, –3, 4}
       Range = {–16, –14, –11, –7, –1}
    c. Domain = {–16, –14, –11, –7, –1}
       Range = {–10, –8, –3, 4}
    d. Domain = $\{-16 \le x \le -1\}$
       Range = $\{-10 \le y \le 4\}$

12. What are the domain and range of the function $f(x) = \sqrt{3 - x}$?
    a. Domain = $\{x \in \mathbf{R}\}$
       Range = $\{y \in \mathbf{R}\}$
    b. Domain = $\{x \in \mathbf{R} \mid x \le 3\}$
       Range = $\{y \in \mathbf{R} \mid y \ge 0\}$
    c. Domain = $\{x \in \mathbf{R} \mid x \ge 0\}$
       Range = $\{y \in \mathbf{R} \mid y \ge 1\}$
    d. Domain = $\{x \in \mathbf{R} \mid 0 \le x \le 3\}$
       Range = $\{y \in \mathbf{R} \mid y \ge 0\}$

Written Solutions

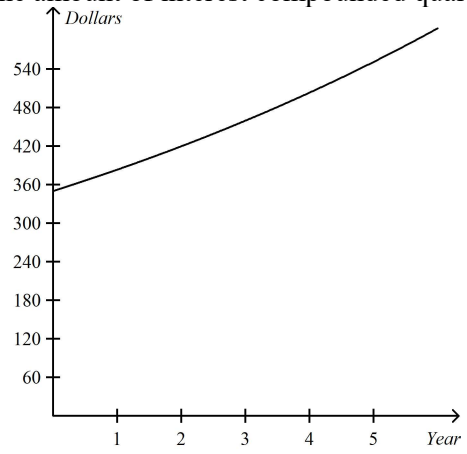
Provide solutions clearly showing your work.

13. Consider the function $f(x) = 3x - 8$. Determine
    a) $f(3k)$.
    b) x, if $f(x) = 4$

14. Consider the function $f(x) = 6 + 5x - 2x^2$. Determine the range of $f(x)$ if the domain is given by $D_f = \{-2, -1, 0, 3\}$.

15. Is the relation $(x - 3)^2 + (y - 4)^2 = 100$ a function? Explain your reasoning.

16. The amount of interest compounded quarterly on a savings deposit of $350 over six years is shown.



Explain why the domain and range have a lower limit. Is the relation a function? Explain.

17. Consider the functions $f(x) = \frac{1}{3x}$ and $g(x) = \frac{1}{x^2}$. Determine $f\left(\frac{1}{12}\right) - g\left(\frac{1}{5}\right)$.

18. Determine the range of the function $f(x) = 7 - 4x$ if the domain is $\{-14, -7.6, -0.5, 3.2, 16.9\}$.

19. State the domain and range of the relation shown. Is the relation a function?