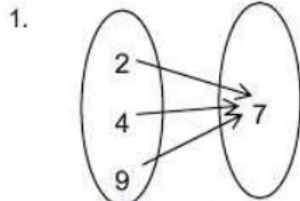


Unit Review – Functions

Determine if the following are functions. State the Domain and Range.



function: yes or no

D: $\{2, 4, 9\}$

R: $\{7\}$

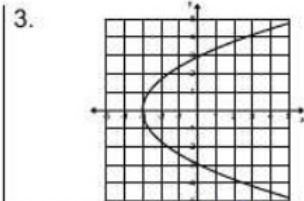
2.

| x | f(x) |
|---|------|
| 0 | 0 |
| 2 | 1 |
| 4 | 3 |
| 6 | 9 |

function: yes or no

D: $\{0, 2, 4, 6\}$

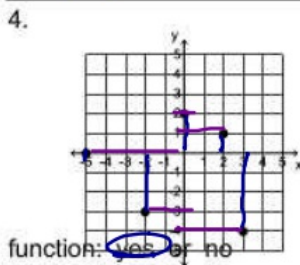
R: $\{0, 1, 3, 9\}$



function: yes or no

D: $[-3, \infty)$

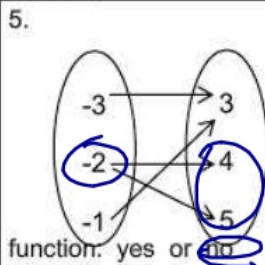
R: $(-\infty, \infty)$



function: yes or no

D: $\{-5, -2, 0, 2, 3\}$

R: $\{-4, -3, 0, 1, 2\}$



function: yes or no

D: $\{-3, -2, -1\}$

R: $\{3, 4, 5\}$

6. $\{(-1, 1), (0, 0), (1, 1), (2, 4)\}$

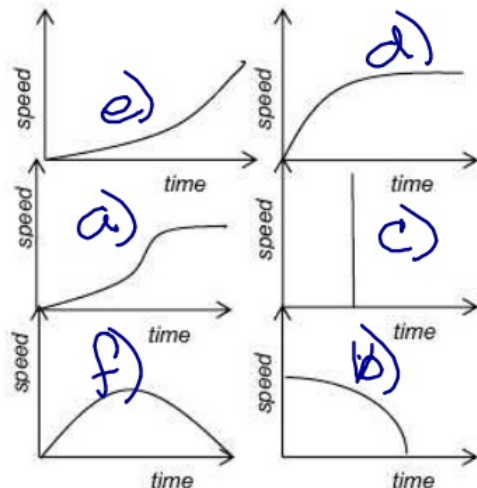
function: yes or no

D: $\{-1, 0, 1, 2\}$

R: $\{0, 1, 4\}$

7. Match the statement to the graph.

- a) Start out slow and slowing increase speed then stay at 35 mph.
- b) From 35 mph to a stop.
- c) From 0 to 50 mph in 0 seconds.
- d) Start out fast and then stay at 35 mph.
- e) Start out slow and keep increasing speed.
- f) Start out and then run out of gas.



8. A tree grows 2 feet every year. Create a table to show how tall the tree will be as it continues to age.

Independent: years

Dependent: height

Discrete or Continuous

9. Generally, the average price of going to the movies has steadily increased over time.

Independent: time

Dependent: price of movie

Discrete or Continuous

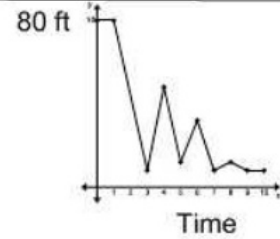
10. The air pressure inside a tire increases as the temperature increases.

Independent: temp.

Dependent: air pressure

Discrete or Continuous

11. Bungee Jumping



Independent Variable: time

Dependent Variable: Pt. (height)

y-intercept: 80 ft.

What's Happening? Jump and bounce up & down.

12. For each domain,

a) state the slope (m) and b) determine the equation of the line for the specified interval, $y = mx + b$.

D: $[0, 4]$ [hint: $(0, 2)$ & $(4, 3)$]

$$m = \frac{\Delta y}{\Delta x} = \frac{1}{4}$$

$$y = \frac{1}{4}x + 2$$

D: $[6, 9]$ $(6, 5)$ $(9, 3)$

$$m = \frac{-2}{3}$$

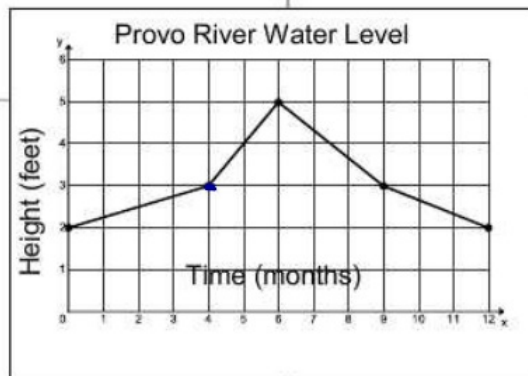
$$y = -\frac{2}{3}x + b$$

$$5 = -\frac{2}{3}(6) + b$$

$$5 = -4 + b$$

$$9 = b$$

$$y = -\frac{2}{3}x + 9$$



$$m = \frac{2}{2} = \frac{1}{1} = 1$$

$$y = 1x + b$$

$$3 = 1(4) + b$$

$$b = -1$$

$$y = x - 1$$

$(9, 3)$ $(12, 2)$ D: $[9, 12]$

$$m = \frac{-1}{3}$$

$$y = -\frac{1}{3}x + b$$

$$3 = -\frac{1}{3}(9) + b$$

$$3 = -3 + b$$

$$6 = b$$

$$y = -\frac{1}{3}x + 6$$

Directions: In each of the following problems, you are given one of the representations of linear function. Complete the representations and answer the questions.
13.

| Context | Table | Questions | | | | | | | | | | | | | | |
|---|--|-----------|-------|---|-----|---|----|---|---|---|----|---|----|---|----|---|
| <p>① <u>Start</u> I owe my sister \$15</p> <p>② <u>rate</u> I pay her \$10 per hour to babysit.</p> | <table border="1"> <thead> <tr> <th>hours</th> <th>money</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>-15</td> </tr> <tr> <td>1</td> <td>-5</td> </tr> <tr> <td>2</td> <td>5</td> </tr> <tr> <td>3</td> <td>15</td> </tr> <tr> <td>4</td> <td>25</td> </tr> <tr> <td>5</td> <td>35</td> </tr> </tbody> </table> | hours | money | 0 | -15 | 1 | -5 | 2 | 5 | 3 | 15 | 4 | 25 | 5 | 35 | <p>a) discrete or continuous</p> <p>b) domain $\{0, 1, 2, \dots\}$</p> <p>c) range $\{-15, -5, 5, \dots\}$</p> <p>d) What is the value at $f(8)$?</p> $f(8) = 10(8) - 15$ $= 80 - 15$ $= 65$ <p>e) What is the value at $f(12)$?</p> $f(12) = 10(12) - 15$ $= 120 - 15$ $= 105$ <p>f) What x-value makes $f(x) = 175$ true?</p> $175 = 10x - 15$ $\begin{array}{r} +15 \\ \hline 190 = 10x \\ \frac{190}{10} = \frac{10x}{10} \\ 19 = x \end{array}$ |
| hours | money | | | | | | | | | | | | | | | |
| 0 | -15 | | | | | | | | | | | | | | | |
| 1 | -5 | | | | | | | | | | | | | | | |
| 2 | 5 | | | | | | | | | | | | | | | |
| 3 | 15 | | | | | | | | | | | | | | | |
| 4 | 25 | | | | | | | | | | | | | | | |
| 5 | 35 | | | | | | | | | | | | | | | |
| <p><u>Graph</u></p> | <p><u>Rate of Change:</u> $m = +10$</p> <p><u>Start Point (y-intercept):</u> $x = 0$ then $y = -15$</p> <p><u>Equation:</u> $f(x) = 10x - 15$</p> | | | | | | | | | | | | | | | |

14.

| <p><u>Context</u></p> <p>You and your friends go to the rock climbing. <u>It costs \$10 to get in and \$2 each session.</u></p> | <p><u>Table</u></p> <table border="1"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td>0</td><td>10</td></tr> <tr><td>1</td><td>12</td></tr> <tr><td>2</td><td>14</td></tr> <tr><td>3</td><td>16</td></tr> <tr><td>4</td><td>18</td></tr> <tr><td>5</td><td>20</td></tr> <tr><td>6</td><td>22</td></tr> </tbody> </table> | x | y | 0 | 10 | 1 | 12 | 2 | 14 | 3 | 16 | 4 | 18 | 5 | 20 | 6 | 22 | <p><u>Questions</u></p> <p>a) <u>discrete</u> or continuous</p> <p>b) domain $\{0, 1, 2, \dots\}$</p> <p>c) range $\{10, 12, 14, \dots\}$</p> <p>d) What is the value at $f(10)$?</p> $f(10) = 2(10) + 10$ $= 20 + 10$ $= 30$ <p>e) What is the value at $f(15)$?</p> $f(15) = 2(15) + 10$ $= 30 + 10$ $= 40$ <p>f) What x-value makes $f(x) = 40$ true?</p> $40 = 2x + 10$ $\begin{array}{r} 40 = 2x + 10 \\ -10 \quad -10 \\ \hline 30 = 2x \\ 15 = x \end{array}$ |
|---|---|---|---|---|----|---|----|---|----|---|----|---|----|---|----|---|----|---|
| x | y | | | | | | | | | | | | | | | | | |
| 0 | 10 | | | | | | | | | | | | | | | | | |
| 1 | 12 | | | | | | | | | | | | | | | | | |
| 2 | 14 | | | | | | | | | | | | | | | | | |
| 3 | 16 | | | | | | | | | | | | | | | | | |
| 4 | 18 | | | | | | | | | | | | | | | | | |
| 5 | 20 | | | | | | | | | | | | | | | | | |
| 6 | 22 | | | | | | | | | | | | | | | | | |
| <p><u>Graph</u></p> | <p><u>Rate of Change (Slope):</u></p> $m = 2$ <p><u>Start Point (y-intercept):</u></p> $y = 10$ <p><u>Equation:</u></p> $f(x) = 2x + 10$ | | | | | | | | | | | | | | | | | |

15.

| <p><u>Context</u></p> <p>① There are 30 jelly beans in the jar.</p> <p>② I am eating them at a rate of 3 per sec.</p> | <p><u>Table</u></p> <table border="1"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td>0</td><td>30</td></tr> <tr><td>1</td><td>27</td></tr> <tr><td>2</td><td>24</td></tr> <tr><td>3</td><td>21</td></tr> <tr><td>4</td><td>18</td></tr> <tr><td>5</td><td>15</td></tr> <tr><td>6</td><td>12</td></tr> </tbody> </table> | x | y | 0 | 30 | 1 | 27 | 2 | 24 | 3 | 21 | 4 | 18 | 5 | 15 | 6 | 12 | <p><u>Questions</u></p> <p>a) <u>discrete</u> or continuous</p> <p>b) domain $\{0, 1, 2, \dots\}$</p> <p>c) range $\{0, \dots, 30\}$</p> <p>d) What is the value at $f(7)$?</p> $f(7) = -3(7) + 30$ $= -21 + 30$ $= 9$ <p>e) What is the value at $f(10)$?</p> $f(10) = -3(10) + 30$ $= -30 + 30$ $= 0$ <p>f) What x-value makes $f(x) = 9$ true?</p> $9 = -3x + 30$ $\begin{array}{r} 9 = -3x + 30 \\ -30 \quad -30 \\ \hline -21 = -3x \\ \frac{-21}{-3} = \frac{-3x}{-3} \\ 7 = x \end{array}$ |
|---|---|---|---|---|----|---|----|---|----|---|----|---|----|---|----|---|----|--|
| x | y | | | | | | | | | | | | | | | | | |
| 0 | 30 | | | | | | | | | | | | | | | | | |
| 1 | 27 | | | | | | | | | | | | | | | | | |
| 2 | 24 | | | | | | | | | | | | | | | | | |
| 3 | 21 | | | | | | | | | | | | | | | | | |
| 4 | 18 | | | | | | | | | | | | | | | | | |
| 5 | 15 | | | | | | | | | | | | | | | | | |
| 6 | 12 | | | | | | | | | | | | | | | | | |
| <p><u>Graph</u></p> | <p><u>Rate of Change:</u></p> -3 <p><u>Start Point (y-intercept):</u></p> 30 <p><u>Equation:</u> $f(x) = -3x + 30$</p> | | | | | | | | | | | | | | | | | |

