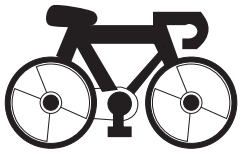
Math 10C: Relations and Functions
PRACTICE EXAM

1. Caitlin rides her bike to school every day. The table of values shows her distance from home as time passes. An equation that describes the data is:

time (minutes)	distance (metres)
0	0
1	250
2	500
3	750
4	1000
5	1250



A. $d = -250t$

B. $d = 250t$

C. $d = t + 250$

D. $d = t + 1$

2. The correct table of values for $y = x^2$ is:

A.

x	y
-2	-4
-1	-1
0	0
1	1
2	4

B.

x	y
-2	-4
-1	-2
0	0
1	2
2	4

C.

x	y
-2	4
-1	1
0	0
1	1
2	4

D.

x	y
-2	4
-1	2
0	0
1	2
2	4

3. A fruit vendor generates a revenue of R dollars by selling n boxes of plums at $3 each. The independent variable is:

A. R

B. n

C. $3

D. Both R and n.

4. Tickets to a concert cost $12 each. The revenue from ticket sales is R, and the number of tickets sold is n. This relation is:

A. Discrete, because a small quantity of tickets are sold.

B. Discrete, because tickets can't be purchased in fractional amounts.

C. Continuous, because a large quantity of tickets are sold.

D. Continuous, because we don't know how many tickets are sold.

5. Nick, a salesman, earns a base salary of \$600/week plus an 8% commission on sales. The amount of money Nick earns in a week is E, and the total value of his sales is s. Write an equation that relates the variables.
Also, how much will Nick have to sell if he earns \$1560 in one week?

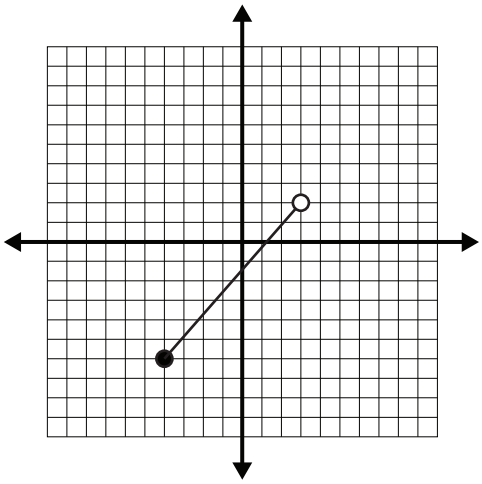
A. $E = 0.08s + 600$, and Nick will have to sell \$725 worth of product to earn \$1560

B. $E = 0.08s + 600$, and Nick will have to sell \$12000 worth of product to earn \$1560

C. $E = 8s + 600$, and Nick will have to sell \$13080 worth of product to earn \$1560

D. $E = 8s + 600$, and Nick will have to sell \$120 worth of product to earn \$1560

6. The domain and range of this graph using ***set notation*** is:



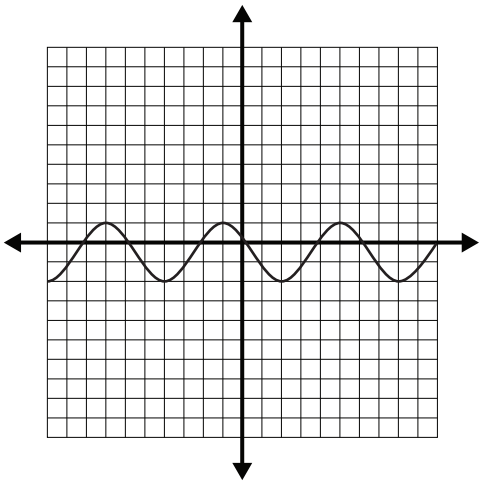
A. Domain : $\{x \mid -4 \le x < 3,\ x \in \mathrm{R}\}$
Range : $\{y \mid -6 \le y < 2,\ y \in \mathrm{R}\}$

B. Domain : $\{x \mid -4 \le x \le 3,\ x \in \mathrm{R}\}$
Range : $\{y \mid -6 \le y \le 2,\ y \in \mathrm{R}\}$

C. Domain : $\{x \mid -6 \le x < 2,\ x \in \mathrm{R}\}$
Range : $\{y \mid -4 \le y < 3,\ y \in \mathrm{R}\}$

D. Domain : $\{y \mid -6 \le y < 2,\ y \in \mathrm{R}\}$
Range : $\{x \mid -4 \le x < 3,\ x \in \mathrm{R}\}$

7. The domain and range of this graph using ***interval notation*** is:



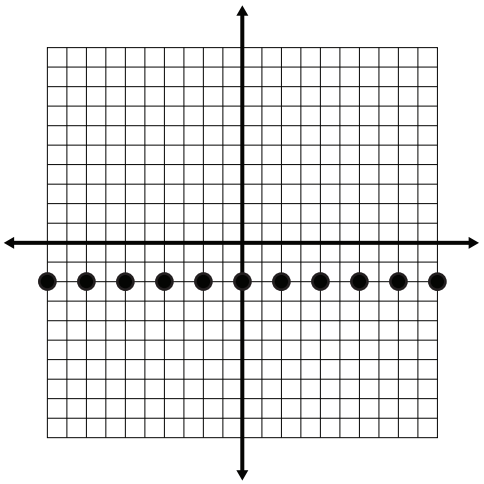
A. Domain: $(-\infty, \infty)$
Range: $[-2,1]$

B. Domain: $(-1,1)$
Range: $[-\infty, \infty]$

C. Domain: $[-2,1]$
Range: $(-\infty, \infty)$

D. Domain: $(-\infty, \infty)$
Range: $[-1,1]$

8. The domain and range of this graph is:



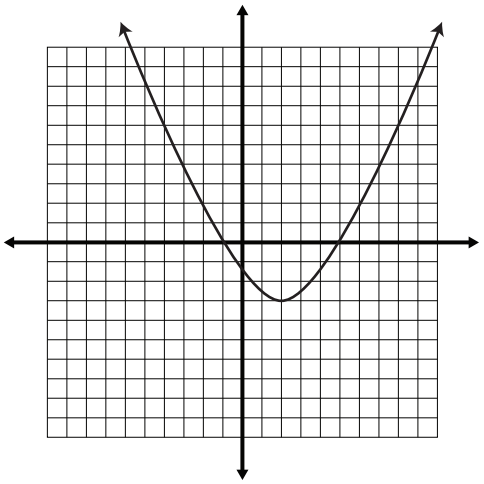
A. Domain: $[-10,10]$
Range: $[-2,-2]$

B. Domain: $\{-10,-8,-6,-4,-2,0,2,4,6,8,10\}$
Range: $\{-2\}$

C. Domain: $\{x \mid -10 \le x \le 10, x \in I\}$
Range: $\{y \mid y = -2\}$

D. Domain: $\{x \mid -10 < x < 10, x \in I\}$
Range: $\{y \mid y = -2\}$

9. The domain and range of this graph is:



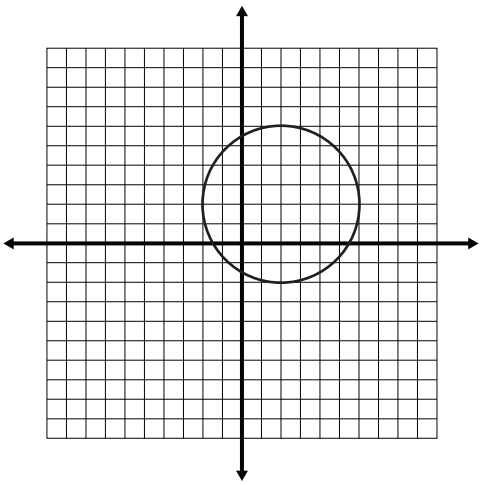
A. Domain: $[-6,10]$
Range: $[-3,11]$

B. Domain: $\{x \mid x \in R\}$
Range: $\{y \mid y \ge -3, y \in R\}$

C. Domain: $\{x \mid x \ge -3, x \in R\}$
Range: $\{y \mid y \in R\}$

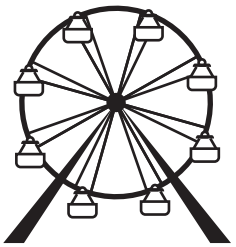
D. Domain: $\{x \mid x \ge -3, x \in R\}$
Range: $\{y \mid y \ge 0, y \in R\}$

10. The domain and range of this graph is:



A. Domain: $-2 \le x \le 6$; Range: $-2 \le y \le 6$
B. Domain: $x \in R$; Range: $-2 \le y \le 6$
C. Domain: $-2 \le x \le 6$; Range: $y \in R$
D. Domain: $x \in R$; Range: $y \in R$

11. A Ferris wheel has a radius of 12 m and makes one complete revolution every two minutes. Riders board the wheel at a height of one metre above the ground. A ride lasts for three revolutions of the wheel. The domain and range is:

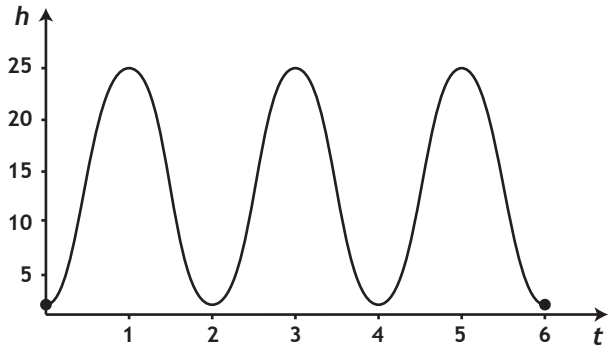


A. Domain: $0 \le t \le 6$; Range: $1 \le h \le 26$

B. Domain: $0 \le t \le 2$; Range: $1 \le h \le 25$

C. Domain: $0 \le t \le 6$; Range: $1 \le h \le 24$

D. Domain: $0 \le t \le 6$; Range: $1 \le h \le 25$



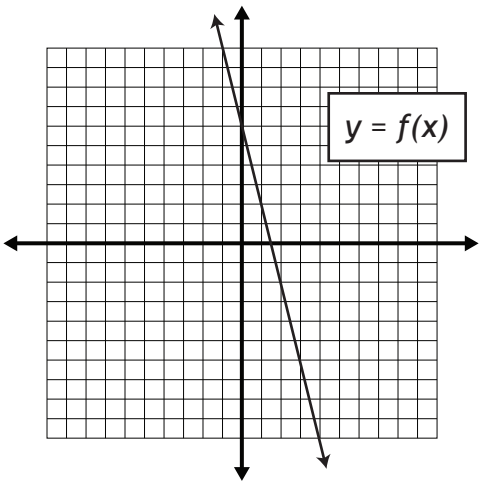
12. Given the function $f(x) = -\frac{1}{3}x - 3$, the value of $f(3)$ is:

A. -13

B. -12

C. -4

D. -2



13. Given the graph of $y = f(x)$, the value of $f(3)$ is:

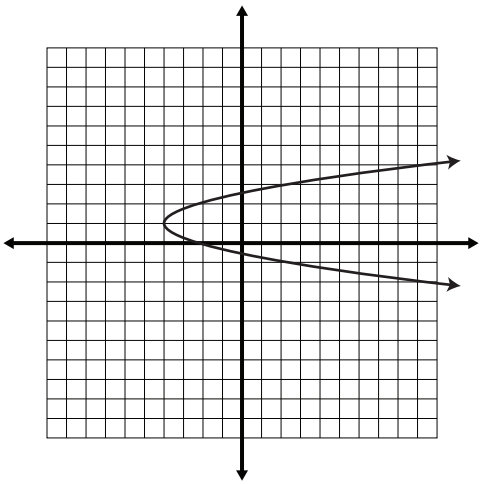
A. -6

B. 1.5

C. 2.1

D. 6

14. The best statement regarding the graph shown is:



A. The graph is not a function because it fails the vertical line test.

B. The graph may not written as $y = f(x)$.

C. The graph has a one-to-many mapping of x-values to y-values.

D. All of the above are true.

15. The point (k, -13) exists on the graph of $f(x) = -\frac{3}{4}x + 5$. The value of k is:

A. -2.5

B. 8

C. 14.75

D. 24

16. A speed walker walks with a speed of 6 km/hour. If the distance walked is d, and the elapsed time is t, write a function that relates the variables. Also, how long does it take for the speed walker to walk 15.6 km?

A. $d(t) = 15.6t$, and it takes 93.6 hours to walk 15.6 km.

B. $d(t) = 15.6t$, and it takes 1 hour to walk 15.6 km.

C. $d(t) = 6t$, and it takes 93.6 hours to walk 15.6 km.

D. $d(t) = 6t$, and it takes 2.6 hours to walk 15.6 km.

17. The cost of a sandwich is $4.40 with two toppings, and $5.00 with five toppings. Write the cost function of the sandwich. Also, what is the price of a sandwich with seven toppings?

A. $C(n) = 0.60n + 4.40$, and a seven-topping sandwich costs $5.40

B. $C(n) = 0.40n + 4.00$, and a seven-topping sandwich costs $6.80.

C. $C(n) = 0.20n + 4.40$, and a seven-topping sandwich costs $5.80.

D. $C(n) = 0.20n + 4.00$, and a seven-topping sandwich costs $5.40.

18. The x- and y-intercepts of $f(x) = \frac{2}{3}x + 2$ are:

A. x-intercept: (-3, 0); y-intercept: (0, 2)

B. x-intercept: (-1, 0); y-intercept: (0, 2)

C. x-intercept: (1, 0); y-intercept: (0, 3)

D. x-intercept: (2, 0); y-intercept: (0, -3)

19. The function $f(x) = 3x + k$ has an x-intercept of -2. The value of k is:

A. -6

B. -2

C. 0

D. 6

20. A mountain climber is at the peak of a mountain with an altitude of 1400 m. It takes 8 hours for the climber to return to ground level. The climber can descend the mountain at an average speed of 175 m/hour. Write a function that relates the height of the mountain climber (h) to the elapsed time (t). Also, what does the t-intercept represent?

A. $h(t) = 8t + 175$. The t-intercept is the time it takes to ascend the mountain.

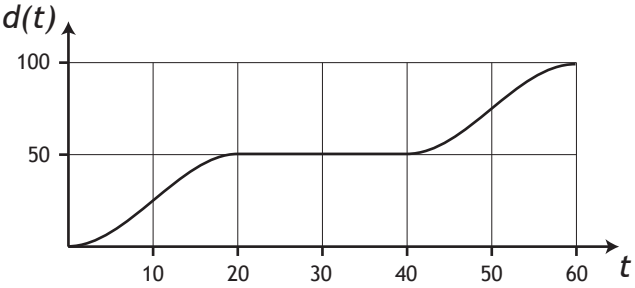
B. $h(t) = -8t + 1400$. The t-intercept is the time it takes to descend the mountain.

C. $h(t) = 175t + 1400$. The t-intercept is the time it takes to ascend the mountain.

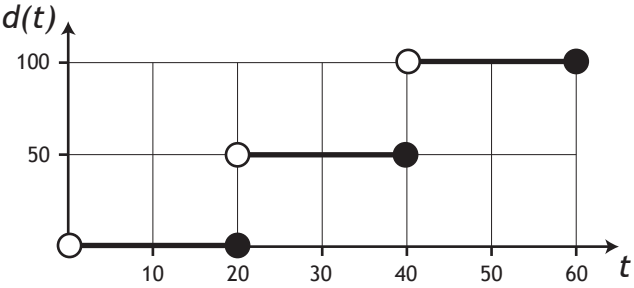
D. $h(t) = -175t + 1400$. The t-intercept is the time it takes to descend the mountain.

21. A fish accelerates to a speed of 2.5 m/s in 6 seconds, holds that speed for 8 seconds, and then decelerates to zero in 6 seconds. After resting for 20 seconds, the fish repeats the motion - accelerate for 6 seconds, hold the speed for 8 seconds, and decelerate for 6 seconds. This graph representing this scenario is:

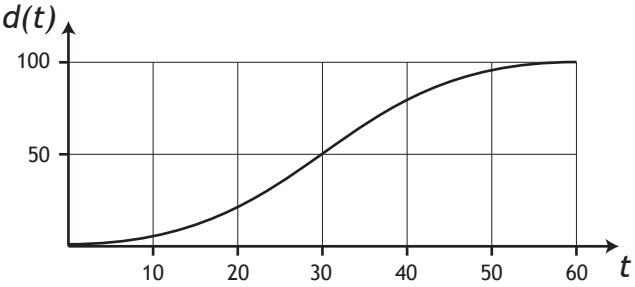
A.



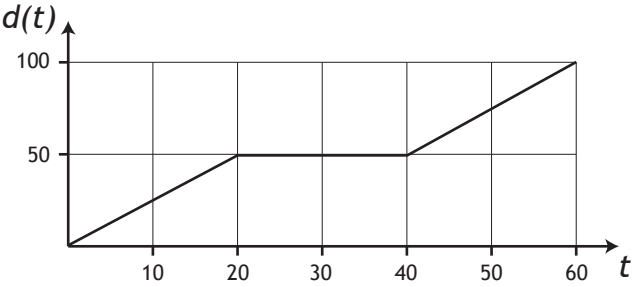
B.



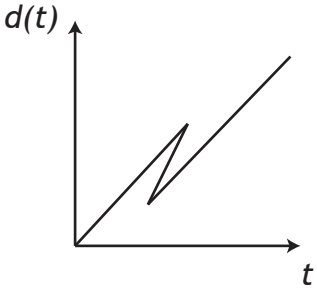
C.



D.



22. The graph on the right represents a potential path Naomi can take from home to school. Which scenario matches the graph?



A. Naomi walks toward the school at a constant speed, turns around and walks away from the school at a different speed, then resumes walking toward the school at the original speed.

B. Naomi walks toward the school at a constant speed, turns around and walks away from the school at the same speed, then resumes walking toward the school at the original speed.

C. Naomi walks north, then south, then north again.

D. There is no real-world scenario that matches the graph.

Relations and Functions - ANSWER KEY

Video solutions are in italics.

1. **B** *Graphing Relations, Introduction (d)*
2. **C** *Graphing Relations, Example 2a*
3. **B** *Graphing Relations, Example 3a*
4. **B** *Graphing Relations, Example 4d*
5. **B** *Graphing Relations, Example 7*
6. **A** *Domain and Range, Introduction (c)*
7. **A** *Domain and Range, Introduction (e)*
8. **B** *Domain and Range, Example 2b*
9. **B** *Domain and Range, Example 5a*
10. **A** *Domain and Range, Example 5b*
11. **D** *Domain and Range, Example 6*
12. **C** *Functions, Example 1c*
13. **A** *Functions, Example 2a*
14. **D** *Functions, Example 2a*
15. **D** *Functions, Example 4b*
16. **D** *Functions, Example 5*
17. **D** *Functions, Example 6a*
18. **A** *Intercepts, Introduction (b)*
19. **D** *Intercepts, Example 1b*
20. **D** *Intercepts, Example 3*
21. **A** *Interpreting Graphs, Introduction (c)*
22. **D** *Interpreting Graphs, Example 2a*

Math 10C Practice Exam: Tips for Students

• Every question in the practice exam has already been covered in the Math 10C workbook. It is recommended that students refrain from looking at the practice exam until they have completed their studies for the unit.

• Do not guess on a practice exam. The practice exam is a self-diagnostic tool that can be used to identify knowledge gaps. Leave the answer blank and study the solution later.