

EOC Review- Unit I: FUNCTIONS 2017

MATH 1 Function Standards (EOC)

| Standard | Summary | Problems |
|----------|--|----------|
| F-IF.1 | Build an understanding that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. (Domain & Range) | Below |
| F-IF.2 | Use function notation to evaluate linear, quadratic, and exponential functions for inputs in their domains, and interpret statements that use function notation in terms of a context. [evaluate $f(5)$ of $f(x)$] | Below |
| F-IF.5 | Interpret a function in terms of the context by relating its domain and range to its graph and, where applicable, to the quantitative relationship it describes. | Below |

Math 8 Function Standards (EOG)

| Standard | Summary | Problems |
|----------|---|----------|
| 8.F.1 | Definition of a function; (input/output, vertical line test, list of ordered pairs) | Below |
| 8.F.3 | Is function linear or nonlinear given a table, graph, equation, or coordinate points. | Below |
| 8.F.5 | (Match/sketch a graph to a verbal description) | Below |

EOC PRACTICE PROBLEMS:

F-IF.1 Problems:

1. In which equation is y **not** a function of x ?

A. $x = 2y - 4$

B. $x = y^2 + 1$

C. $x^2 = y - 5$

D. $x^2 = 2y + 6$

2. In which table is y a function of x ?

A.

| x | y |
|-----|-----|
| -2 | -2 |
| -1 | -1 |
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |

B.

| x | y |
|-----|-----|
| -2 | -2 |
| -1 | -1 |
| -2 | 0 |
| -1 | 1 |
| -2 | 2 |

C.

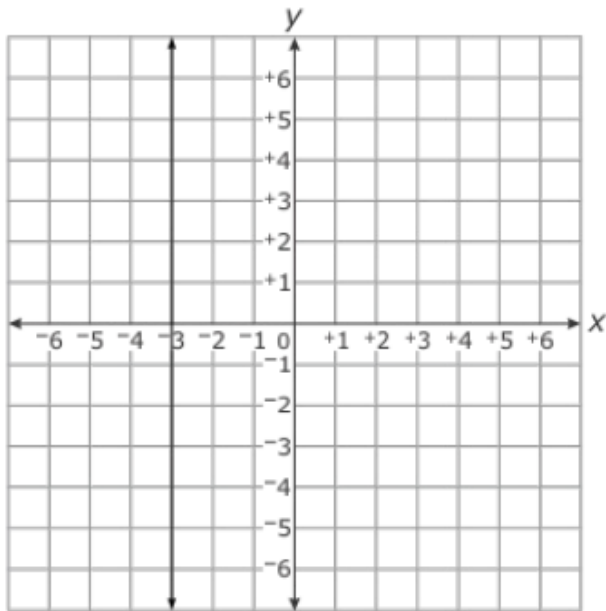
| x | y |
|-----|-----|
| 2 | -2 |
| -1 | -1 |
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |

D.

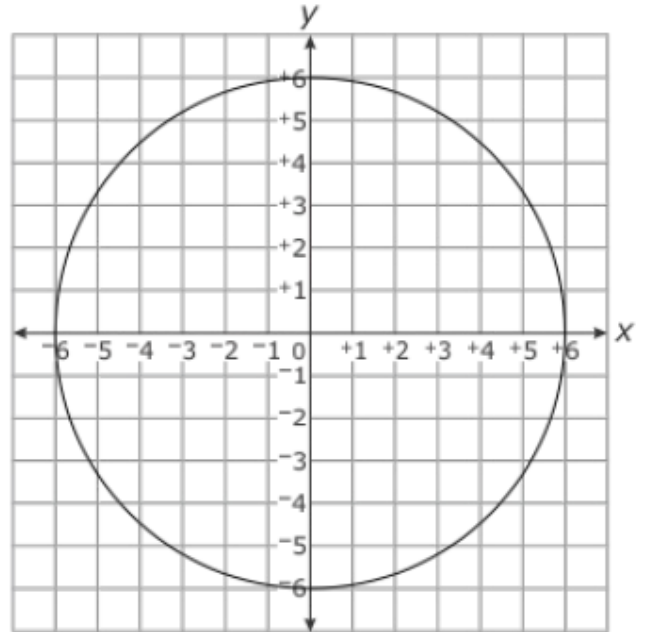
| x | y |
|-----|-----|
| 1 | -9 |
| 0 | 8 |
| 0 | -7 |
| -1 | 6 |
| 2 | -5 |

4. In which graph is y a function of x ?

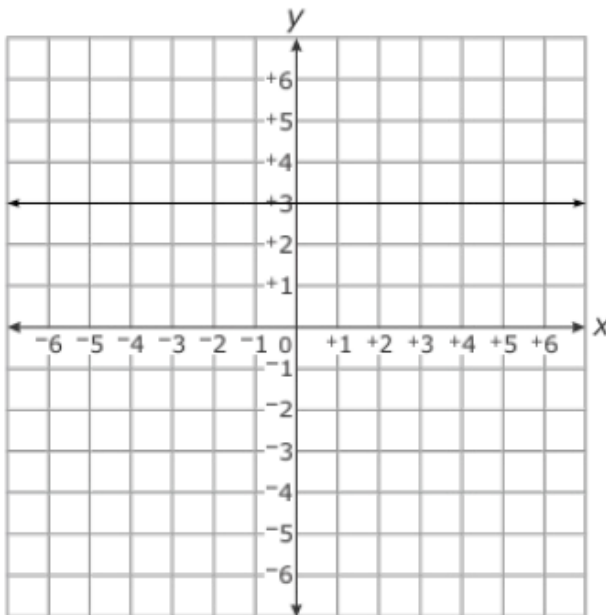
A.



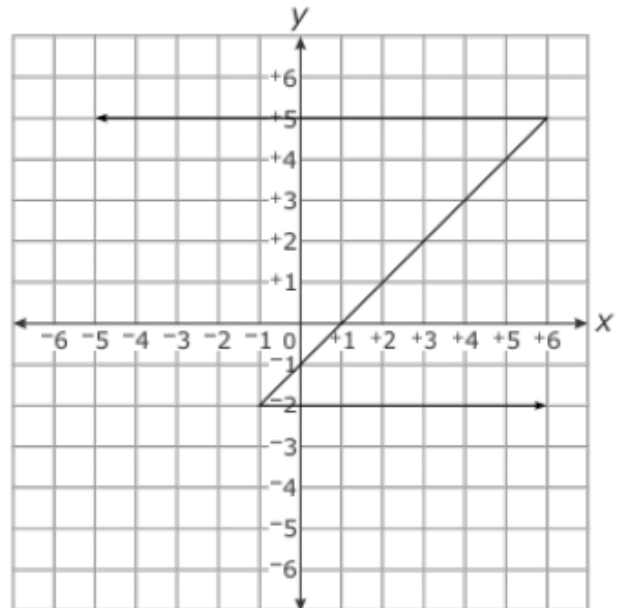
B.



C.



D.



6. In which equation is y **not** a function of x ?

A. $y = 2x^2 - 5$

B. $y^2 = x + 6$

C. $-4x + y = -3$

D. $y = \frac{2}{x+3}$

7. In which table is y a function of x ?

A.

| x | y |
|-----|-----|
| -3 | 4 |
| -1 | 7 |
| 1 | 10 |
| -3 | 13 |

B.

| x | y |
|-----|-----|
| -2 | 3 |
| 0 | 4 |
| 2 | 3 |
| 4 | 6 |

C.

| x | y |
|-----|-----|
| -4 | -8 |
| -1 | -10 |
| -6 | -12 |
| -4 | -14 |

D.

| x | y |
|-----|-----|
| 2 | -5 |
| 2 | -3 |
| 2 | 2 |
| 2 | 6 |

8. In which choice is y **not** a function of x ?

A. $y = 8x + 6$

B. $y = 3^x$

C. $y = 6$

D. $x = -5$

F-IF.2 Problems:

2. If $r(x) = 120 + 18x - 3x^2$, what is $r(2)$?

A. 120

B. 144

C. 168

D. 192

4. The function $f(x) = 19,500(0.92)^x$ can be used to predict the value of a car x years from now. What is the predicted value of the car 21 months from now?
- A. \$3,385.16
 - B. \$7,169.49
 - C. \$16,367.75
 - D. \$16,852.46
5. Patrick bought a boat for \$9,500. The function $f(x)=9,500(0.70)^x$ models the value of the boat x years after he purchased it. How much did the value of the boat decrease in the first year after Patrick bought the boat?
- A. \$1,597
 - B. \$2,850
 - C. \$6,650
 - D. \$7,903
16. Mr. Levy invested \$6,500 at a 4.5% annual interest rate. The function $f(t) = 6,500(1.045)^t$ models the value of the investment after t years. What is the value of the investment after 18 months?
- A. \$6,872.56
 - B. \$6,943.65
 - C. \$11,349.20
 - D. \$14,355.11
23. If $f(x) = x^2 - x$, what is $f(-5)$?
- A. -30
 - B. -20
 - C. 20
 - D. 30

28. The function $f(x) = 40,000(1.03)^x$ is used to predict the population of a town x years after 2010. What is the meaning of $f(5)$?
- A. the population of the town in the year 2010 multiplied by 5
 - B. the year the population of the town reaches 5,000
 - C. the population of the town in 2005
 - D. the population of the town in 2015
47. If $g(x) = x^2 + 6$, what is the value of $g(x + 1)$?
- A. 7
 - B. $x^2 + 1$
 - C. $x^2 + x + 6$
 - D. $x^2 + 2x + 7$
48. Suppose $f(x) = \frac{2}{x}$ and $g(x) = 2x - 3$. What is the value of $g(4) + f(-3)$?
- A. -4
 - B. 7
 - C. 14
 - D. 25

F-IF.5 Problems:

1. A high school baseball team is having a fundraiser at a restaurant. The function $f(x) = 4x$ models the amount of money that the restaurant will donate to the team if x customers purchase dinner. The restaurant agrees to donate a maximum of \$500 to the team. What is the **most appropriate** domain of the function?
- A. all nonnegative integers ≤ 4
 - B. all nonnegative integers ≤ 125
 - C. all nonnegative integers ≤ 500
 - D. all nonnegative integers

2. The function $f(x)=3.33x$ models the cost for Juan to fill his car with x gallons of gas. Juan's car can hold a maximum of 17 gallons of gas. What is the **most appropriate** domain of the function?
- A. $x \leq 17$
 - B. $x \leq 56.61$
 - C. $0 \leq x \leq 17$
 - D. $0 \leq x \leq 56.61$
3. Martin modeled the distance, y , that runners traveled during a race as a function of the time, x , that they ran. Which would **best** describe the domain of this function?
- A. all integers
 - B. all real numbers
 - C. all positive integers
 - D. all positive real numbers
4. An ice cream shop uses the function $f(p) = 2.50p - 300$ to calculate the amount of profit or loss, $f(p)$, the store makes each day after selling p number of ice cream cones. Which domain is appropriate for the function and shows the ice cream shop making a profit?
- A. all positive integers
 - B. all positive rational numbers
 - C. all integers greater than 120
 - D. all rational numbers greater than 120

6. The function $h(t) = 1,000(0.95)^t$ models the size of a mold culture t hours after being treated. What is the **most appropriate** domain for this function?
- A. all integers
 - B. positive integers
 - C. all rational numbers
 - D. positive rational numbers
7. The function $f(x) = 1,575 - 225x$ models the value of a computer x years after it was purchased. What is an appropriate domain for this function?
- A. $x \geq 0$
 - B. $x \leq 7$
 - C. $0 \leq x \leq 7$
 - D. $0 \leq x < 7$

8th grade EOG PRACTICE PROBLEMS:

8.F.1 Problems:

1. Which of the following relations is a function?
- A. $x = 8$
 - B. $y = 8$
 - C. $x = |8y|$
 - D. $y^2 = 8x$
2. Which equation is not a function?
- A. $y = x^2 - 4$
 - B. $x + 2y = 8$
 - C. $x + y^2 = 16$
 - D. $y = 3x - 20$

3. Which relation is a function?

- A. $\{(8, 2), (6, 5), (-6, 0), (8, -4)\}$
- B. $\{(2, 2), (4, 5), (-4, 5), (6, 7)\}$
- C. $\{(0, 2), (2, 5), (4, 6), (4, 7)\}$
- D. $\{(-4, -6), (-3, -5), (-2, -4), (-2, -3)\}$

4. An input-output table is shown.

| Input | Output |
|-------|--------|
| 1 | 1 |
| 2 | 4 |
| 3 | 9 |
| 4 | 16 |
| 5 | 25 |

What is the relationship between each input number and each output number in the table?

- A. Each input number is multiplied by 2 to get the output number.
- B. Each input number is multiplied by itself to get the output number.
- C. Each input number is added to 3 to get the output number.
- D. Each input number is added to 9 to get the output number.

5. Which chart represents a function?

A.

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

B.

| x | y |
|---|----|
| 2 | 6 |
| 4 | 10 |
| 6 | 14 |
| 8 | 18 |

C.

| x | y |
|----|----|
| -2 | 2 |
| 2 | -3 |
| 2 | 2 |
| 3 | -3 |

D.

| x | y |
|----|----|
| 3 | 2 |
| 3 | -2 |
| 5 | 24 |
| -5 | 24 |

6. Which ordered pair (x, y) makes the relation below a function?

$\{(1, 2), (-2, 4), (3, 3), (-4, 4), (x, y)\}$

- A. $(-4, -2)$
- B. $(-2, 3)$
- C. $(3, 2)$
- D. $(5, 1)$

7. Which of the equations shown below represents a function?

Equation 1 : $y = x^2 + 2x + 9$

Equation 2 : $x = 9 - y^2$

- A. Only 1
- B. Only 2
- C. Both 1 and 2
- D. Neither 1 nor 2

8.F.3 Problems:

1. Which set of points are linear?

- A. $(-1, -2), (0, 6), (1, 2)$
- B. $(0, -4), (1, -1), (3, 5)$
- C. $(2, 3), (4, 2), (6, 3)$
- D. $(1, 1), (4, 16), (6, 36)$

2. Which table shows a nonlinear function?

A.

| x | y |
|-----|-----|
| -2 | 8 |
| -1 | 4 |
| 0 | -2 |
| 1 | -10 |

B.

| x | y |
|-----|-----|
| -2 | 5 |
| -1 | 4 |
| 0 | 3 |
| 1 | 2 |

C.

| x | y |
|-----|-----|
| -2 | -1 |
| -1 | 1 |
| 0 | 3 |
| 1 | 5 |

3. In which table is y a nonlinear function of x ?

A.

| x | y |
|-----|-----|
| 3 | -2 |
| 3 | 0 |
| 3 | 4 |
| 3 | 5 |
| 3 | 8 |

B.

| x | y |
|-----|-----|
| 6 | 4 |
| 4 | 2 |
| 2 | 0 |
| 0 | 2 |
| -2 | 4 |

C.

| x | y |
|-----|-----|
| 6 | 4 |
| 4 | 2 |
| 2 | 0 |
| 4 | -2 |
| 6 | -4 |

D.

| x | y |
|-----|-----|
| -3 | 4 |
| -2 | 5 |
| -1 | 6 |
| 0 | 7 |
| 1 | 8 |

4. Which function is non-linear?

A.

| x | y |
|-----|-----|
| 0 | 0 |
| 2 | 4 |
| 3 | 9 |

B.

| x | y |
|-----|-----|
| 2 | 1 |
| 4 | 3 |
| 6 | 5 |

C. $y = 4$

D. $2x - 4y = 15$

6. Which relationship about earnings does not represent a linear function?

- A. a teacher's earnings based on a monthly salary
- B. a realtor's earnings based on percent of weekly sales
- C. a marketing director's earnings based on an annual salary
- D. a construction worker's earnings based on an hourly wage

7. Bacteria grow in colonies over time. Which table shows growth of bacteria colonies that can be modeled by a linear graph?

A.

| | | | | |
|---------------------------|---|---|---|----|
| Time (in hours) | 1 | 2 | 3 | 4 |
| Number of Colonies | 1 | 4 | 9 | 16 |

B.

| | | | | |
|---------------------------|---|----|----|----|
| Time (in hours) | 1 | 2 | 3 | 4 |
| Number of Colonies | 5 | 10 | 15 | 20 |

C.

| | | | | |
|---------------------------|---|----|----|-----|
| Time (in hours) | 1 | 2 | 3 | 4 |
| Number of Colonies | 1 | 16 | 81 | 256 |

D.

| | | | | |
|---------------------------|---|----|-----|-----|
| Time (in hours) | 1 | 2 | 3 | 4 |
| Number of Colonies | 5 | 25 | 125 | 625 |

10. Which function is **not** linear?

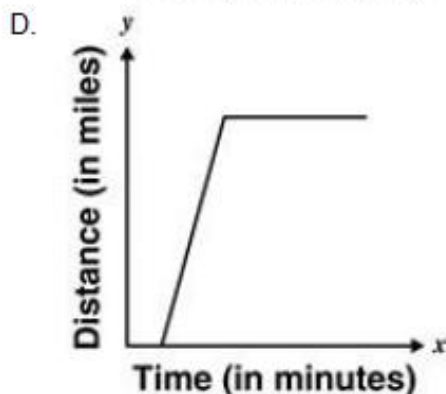
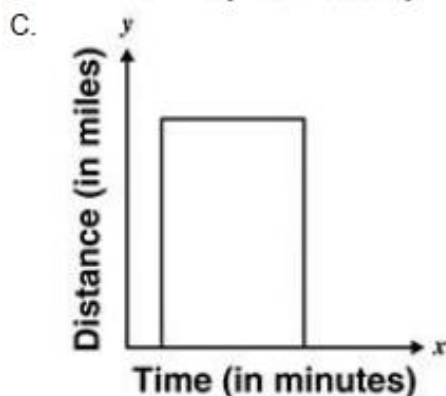
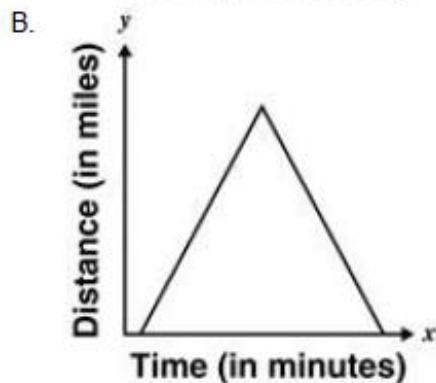
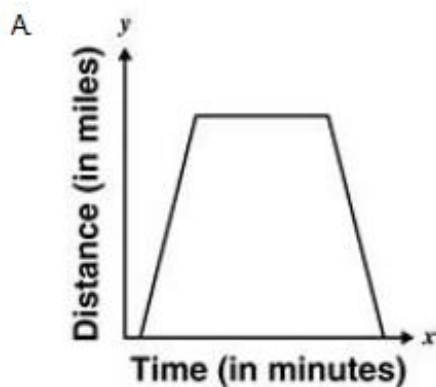
9. Which represents a linear function?

- A. $y = \frac{5}{x}$
- B. $y = x^2 - 3$
- C. $y = |x - 1|$
- D. $y = \frac{1}{2}x + 2$

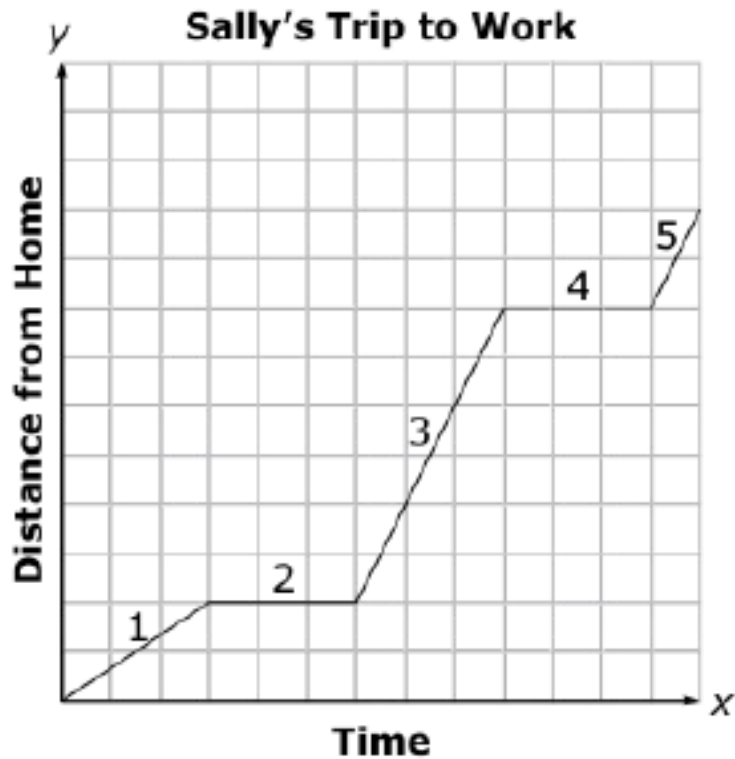
- A. $\frac{y}{x} = 2$
- B. $y = 3$
- C. $y = \frac{6}{x}$
- D. $x + y = -7$

8.F.5 Problems:

2. A school bus was stopped for 2 minutes at a red light. When the light turned green, the driver accelerated the bus at a steady rate and then continued driving at a constant speed. Next, the driver decreased the speed of the bus until it came to a full stop to pick up students. Which graph below best represents the speed of the bus over the time described?



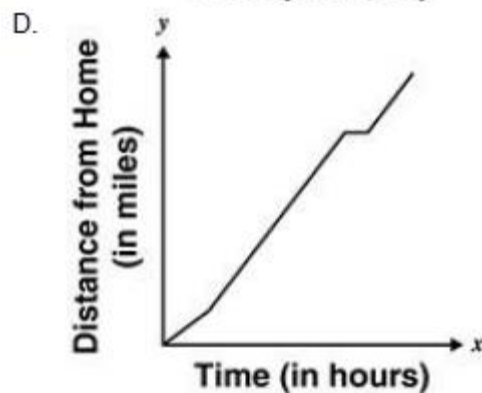
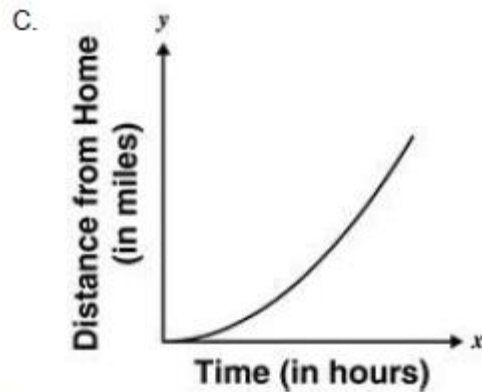
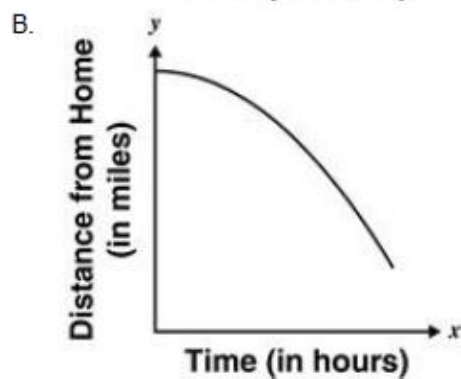
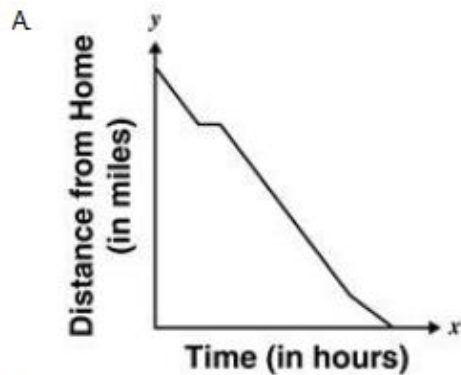
3. The graph below details Sally's daily trip to work.



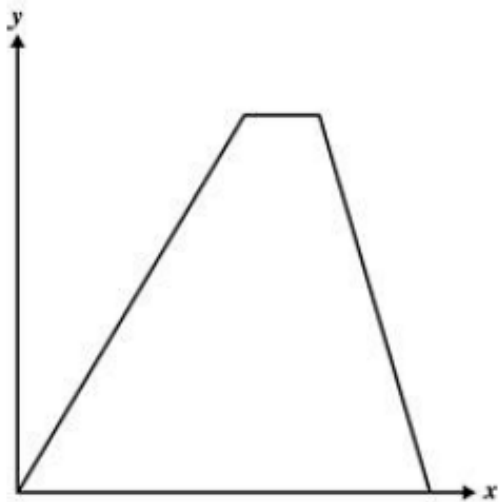
Which is the **best** scenario for part 3 on the graph?

- A. Sally is waiting at a stop light.
- B. Sally is driving on an incline at a constant rate.
- C. Sally is driving on a highway at a constant rate.
- D. Sally is speeding up then slowing down through a neighborhood.

4. Aki drove from home to visit a friend. His average speed during the first hour was 40 miles per hour (mph). For the next 3 hours he drove on the highway at 70 mph and then rested for 30 minutes. After the rest, Aki continued on the highway at 70 mph. Which graph best represents his distance from home as a function of time?



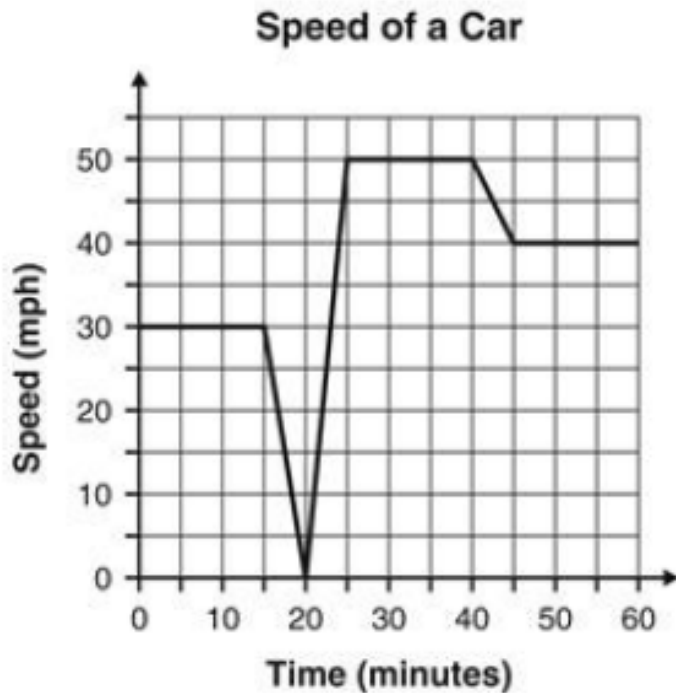
6. The graph below shows the relationship between two variables.



Which scenario is best represented by the graph?

- The value of a car decreased at a constant rate, remained constant for a while, and then began to increase.
- The number of animals in the local zoo increased at a constant rate over the first ten years after the zoo opened.
- The average rainfall in a town was constant for the first 4 months of the year. Over the next 6 months it increased and then gradually decreased.
- The number of customers in a diner increased at a constant rate during the morning hours, remained the same during lunch, and decreased during the afternoon hours.

28. The graph shows different speeds, in miles per hour (mph), of a car traveling on a trip.



How fast was the car traveling in miles per hour (mph) between 25 minutes and 40 minutes?

- A. speeds between 20 mph and 50 mph
- B. speeds between 35 mph and 0 mph
- C. a constant speed of 40 mph
- D. a constant speed of 50 mph