

## A.3B Calculate the Rate of Change of a Linear Function

Some questions (c) 2017 by Region 10 Educational Service Center.

Some questions (c) 2017 by TEKS Resource System.

Some questions (c) 2017 by The Texas Education Agency.

- 1** Mario lives 2 miles from his school and rides his bike there each day. He rides past one block every 50 seconds. Each block is 300 feet long. What is the rate, in feet per second, at which Mario rides his bike?
- A** 6 feet per second
  - B** 25 feet per second
  - C** 60 feet per second
  - D** 100 feet per second

- 2 Peach Produces pays its employees by the formula,  $P(b) = \frac{5}{2}b + 45$ , where  $P(b)$  is the employee's total daily pay and  $b$  is the number of bushels of peaches picked. According to the formula, what is the rate employees are paid per bushel of peaches picked?
- A \$45.00
  - B \$5.00
  - C \$2.50
  - D \$2.00
- 3 The function  $y = 3.75 + 1.5(x - 1)$  can be used to determine the cost in dollars for a taxi ride of  $x$  miles. What is the rate of change of the cost in dollars with respect to the number of miles?
- A \$1.50 per mile
  - B \$3.75 per mile
  - C \$4.25 per mile
  - D \$5.25 per mile

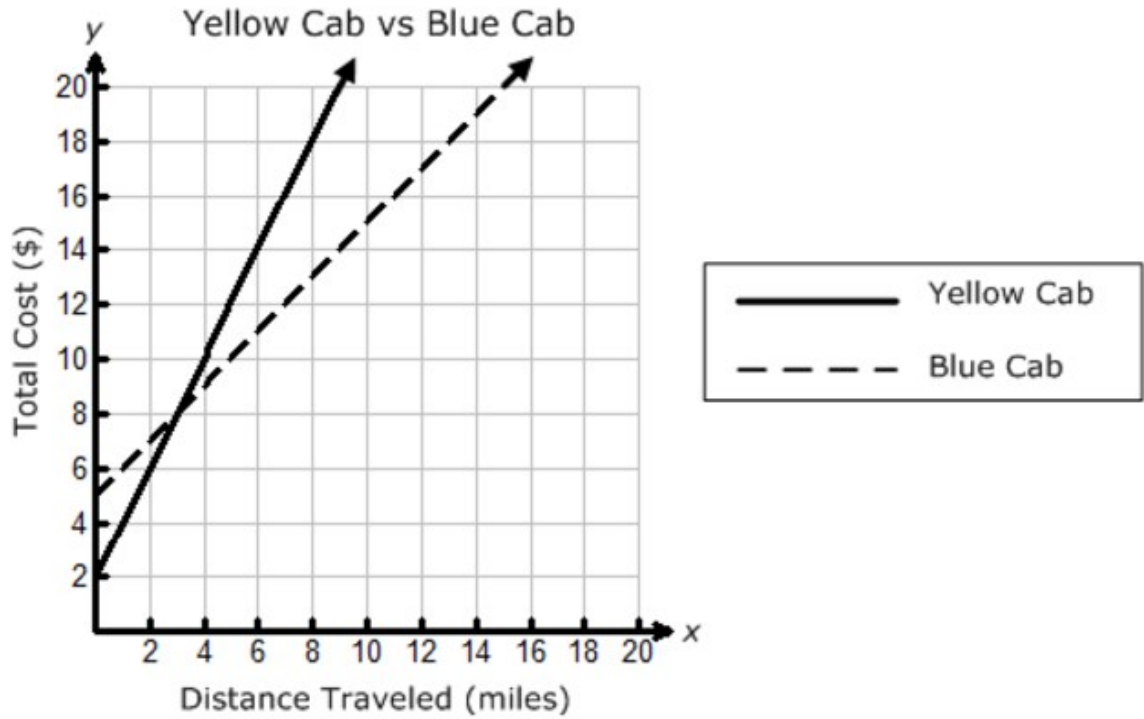
- 
- 4 The amount of water that flows through the Hoover dam can be calculated using the following formula in which  $y$  equals the number of seconds and  $x$  equals the number of cubic feet:

$$6000x - 2y = 0$$

What is the rate at which the water flows?

- A 3,000 cubic feet per second
- B 6,000 cubic feet per second
- C 9,000 cubic feet per second
- D 12,000 cubic feet per second

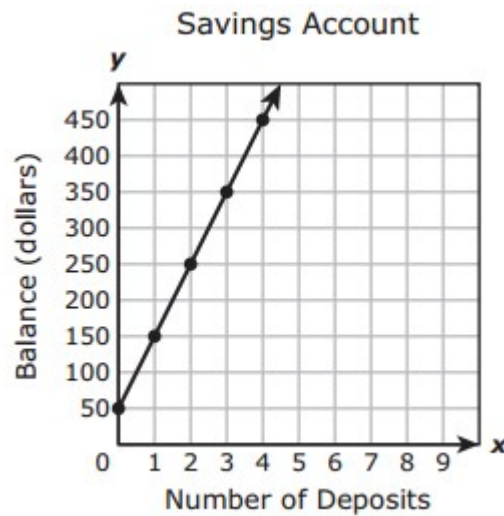
- 5 The graph below illustrates the cost for renting a cab at the Yellow Cab Company and the Blue Cab Company.



What is the rate of change of the cost with respect to the number of miles for the Yellow Cab Company?

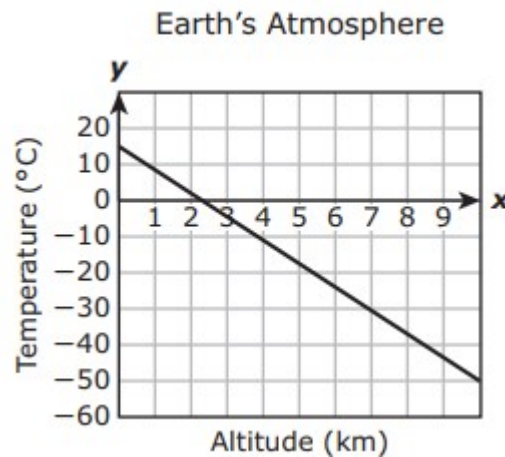
- A \$3
- B \$2
- C \$1
- D \$0.50

- 6 A savings account balance can be modeled by the graph of the linear function shown on the grid.



What is the rate of change of the balance with respect to the number of deposits?

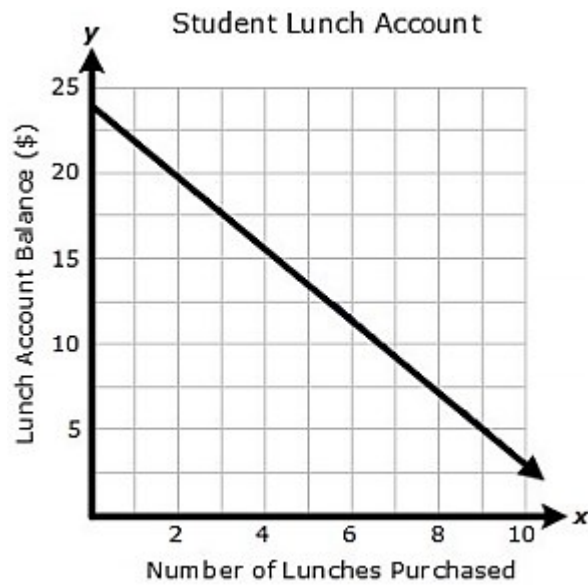
- A \$100 per deposit
  - B \$50 per deposit
  - C \$0.50 per deposit
  - D \$2 per deposit
- 7 The graph models the linear relationship between the temperature of Earth's atmosphere and the altitude above sea level.



Which of these best represents the rate of change of the temperature with respect to altitude?

- A  $-6.5^{\circ}\text{C}/\text{km}$
- B  $-3.5^{\circ}\text{C}/\text{km}$
- C  $-0.15^{\circ}\text{C}/\text{km}$
- D  $0.29^{\circ}\text{C}/\text{km}$

- 8 The graph shows the linear relationship between the balance in a student's school lunch account and the number of school lunches purchased.



Which of these best represents the rate of change of the account balance with respect to the number of lunches purchased?

- A  $-\$0.50$  per lunch purchased
- B  $-\$0.85$  per lunch purchased
- C  $-\$1.18$  per lunch purchased
- D  $-\$2.14$  per lunch purchased

- 9 The table represents some points on the graph of a linear function.

$x$	$y$
-2	12
0	3
3	-10.5
7	-28.5

What is the rate of change of  $y$  with respect to  $x$  for this function?

- A  $\frac{2}{9}$
- B  $-\frac{9}{2}$
- C  $\frac{9}{2}$
- D  $-\frac{2}{9}$
- 10 The table shows the linear relationship between the average height in feet of trees on a tree farm and the number of years since the trees were planted.

Average Tree Height

Number of Years Since the Trees Were Planted	1	3	6	11	15
Average Height (ft)	10	24	45	80	108

What is the rate of change of the average height in feet of the trees on the farm with respect to the number of years since the trees were planted?

- A 14 ft/yr
- B 3 ft/yr
- C 7 ft/yr
- D 10 ft/yr



- 11** The table shows the linear relationship between the total cost of orders of t-shirts and the number of t-shirts ordered.

T-shirt Order Cost

Number of T-shirts	13	24	32	38
Total Cost of Order (dollars)	154.50	263.95	343.55	403.25

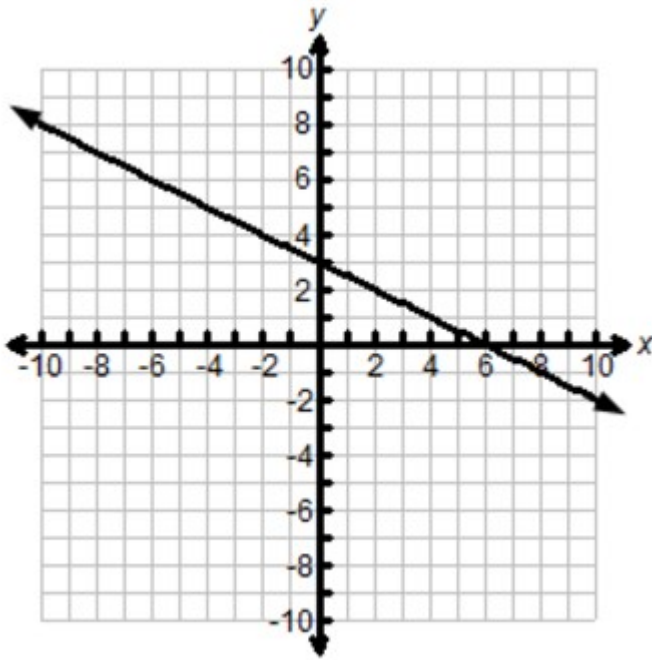
Based on the table, what is the rate of change of the total cost in dollars with respect to the number of t-shirts ordered?

- A** \$1.70 per shirt
- B** \$9.95 per shirt
- C** \$11.88 per shirt
- D** \$12.16 per shirt

**12** Which representations have the same rate of change of  $y$  with respect to  $x$  as the equation  $x + 2y = 6$ ?

**A**  $y = -\frac{1}{2}x + 2$

**B**



**C**

$x$	$y$
-15	-0.5
-10	-3
-5	-5.5
0	-8
5	-10.5
10	-13

**D** All of the above