



## Grade 8 Mathematics EOG (GSE) Quiz Answer Key

Functions - (MGSE8.F.4) Construct A Function

Student Name: \_\_\_\_\_

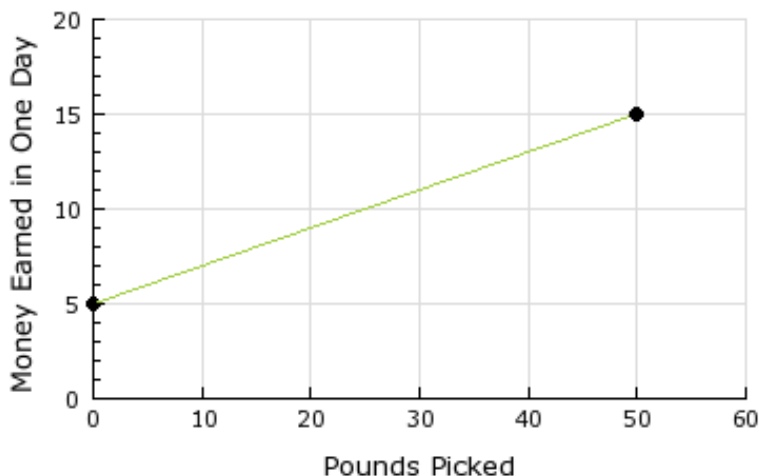
Date: \_\_\_\_\_

Teacher Name: THUYNGA DAO

Score: \_\_\_\_\_

1)

### Money Earned



Which situation matches the graph shown?

- A) Jimmy has a summer job, he picks blueberries. He makes \$5 a day plus \$2 for every pound picked.
- B) Jimmy has a summer job, he picks blueberries. He makes \$2 a day plus \$5 for every 10 pounds picked.
- C) Jimmy has a summer job, he picks blueberries. He makes \$2 a day minus \$5 for every 10 pounds picked.
- D) Jimmy has a summer job, he picks blueberries. He makes \$5 a day plus \$2 for every 10 pounds picked.

**Explanation:**

Jimmy has a summer job, he picks blueberries. He makes \$5 a day plus \$2 for every 10 pounds picked.

2) A school club is raising money for a trip, and needs to reach \$10,000. Their fundraising progress is modeled by the function

$f(x) = 435 + 1200x$ , where  $x$  is measured in weeks.

What is the meaning of the constant 435?

- A) It is the amount they started with.
- B) It is the amount still to be raised.
- C) It is the amount which is left over.
- D) It is the amount they raise each week.

**Explanation:**

It is the amount they started with. Since  $f(0) = 435$ , this is the initial amount, before the fundraising started.

3)

x	y
24	32
18	26

12	20
10	18

Which equation could be used to describe the rule for the table?

- A)  $y = 6x$
- B)  $y = x + 8$**
- C)  $y = x + 6$
- D)  $y = 2x + 8$

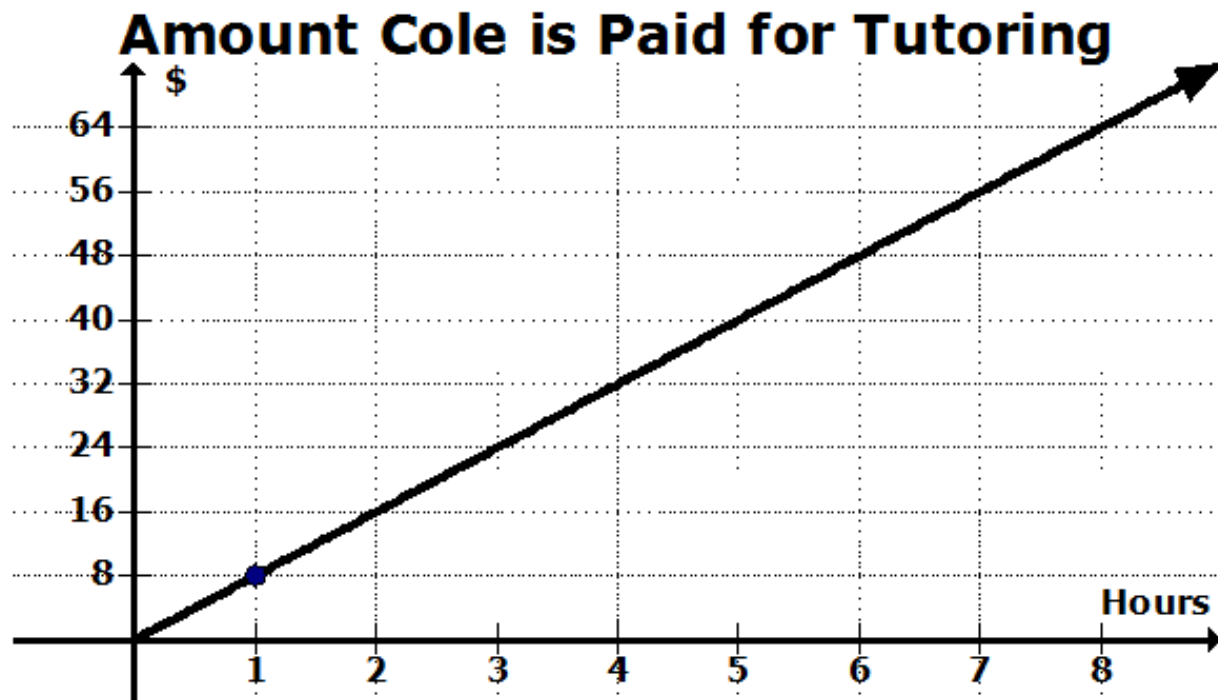
**Explanation:**

**$y = x + 8$**

Adding 8 to the value represented by "x" equals the value represented by "y".

$24 + 8 = 32$ ;  $18 + 8 = 26$ ;  $12 + 8 = 20$ ;  $10 + 8 = 18$ .

4)



Cole is investigating the relationship between the number of hours he tutors and the amount he is paid in dollars. He made the graph shown to model the relationship.

Choose the incorrect statement based on the data shown in Cole's graph.

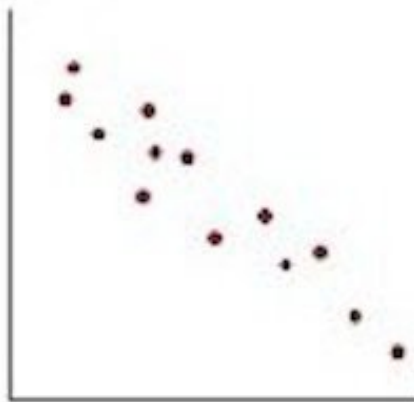
- A) If Cole tutors 5 hours, he will be paid \$40.
- B) If Cole tutors 3 hours, he will be paid \$24.
- C) If Cole tutors 7 hours, he will be paid \$64.**
- D) If Cole tutors 4 hours, he will be paid \$32.

**Explanation:**

. If Cole tutors 7 hours, he will be paid \$64.

The unit rate for this graph is located at the point (1, 8), so the unit rate is \$8.00 per hour. For Cole to earn \$64.00 he will have worked for 8 hours. The statement is incorrect because it says that if Cole tutors 7 hours, he will be paid \$64. ; which is untrue according to the data shown in Cole's graph.

5)



Susan found the equation of the best fit line for the data shown in the scatterplot. The slope of the line of best fit is

- A) negative.**
- B) positive.

- C) undefined.
- D) zero.

**Explanation:**

**negative.** The points in the scatterplot are descending from left to right. Most of the points are close to each other. There is a strong negative correlation. The slope of the equation of the best fit line would be negative.

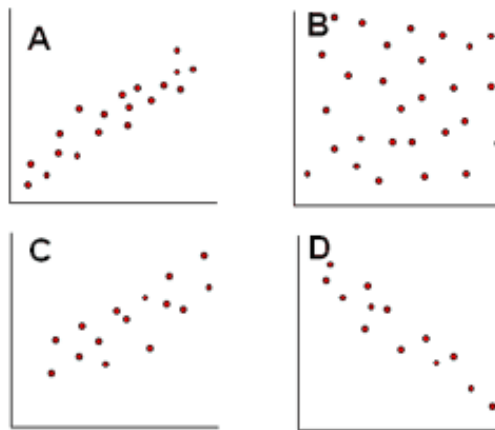
6) Henry can build 2 birdhouses in 30 minutes. How many birdhouses can he build in four hours?

- A) 4 birdhouses
- B) 8 birdhouses
- C) 12 birdhouses
- D) **16 birdhouses**

**Explanation:**

If he can build 2 birdhouses in 30 minutes then he can build 4 birdhouses in 1 hour. Multiply the number of birdhouses he can build in 1 hour by the number of hours:  $4 \times 4$  to find that he can build **16 birdhouses** in 4 hours.

7)



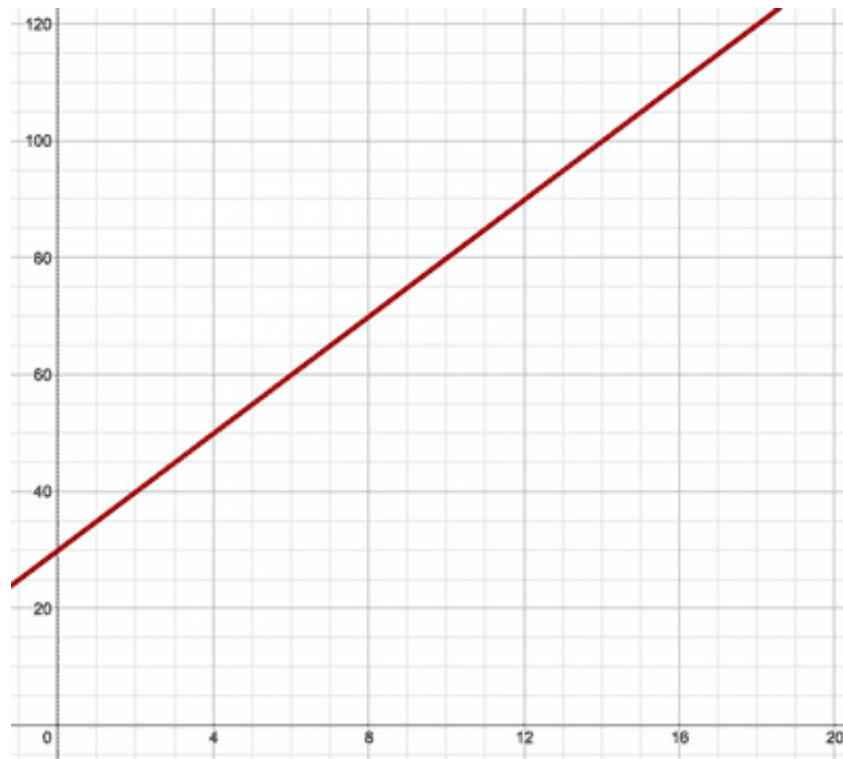
Which scatterplot could not be represented by a best fit line?

- A) A
- B) B**
- C) C
- D) D

**Explanation:**

**B** The points are far apart with no apparent correlation to each other. So, a line of best fit cannot be drawn.

8)



The graph shows the amount that Miracle Maid Service charges to clean a house. They charge a flat house visit fee plus an additional cost per room to clean a house. How much is the initial house visit fee?

- A) \$10
- B) \$20
- C) **\$30**
- D) \$4

**Explanation:**

The Miracle Maid Service charges a flat house visit fee. You can see this amount when  $x = 0$  on the graph. Therefore, the house visit fee is **\$30**.

9) In the function  $y = 10.00x + 35$ ,  $y$  represents the cost of cabin lodging per occupant and  $x$  represents the number of occupants. How much does the cost increase for every occupant?

- A)  $x$
- B) **\$10.00**
- C) \$35.00
- D) \$45.00

**Explanation:**

**\$10.00** is correct. The slope is the coefficient in front of  $x$ . Since the slope of the equation is 10.00, the cabin cost increases \$10.00 per occupant.

10) A baby elephant weighs 200 pounds at birth. Seven years later, the elephant's weight is 3,000 pounds.

What is the rate of change of the weight of the elephant?

- A) **400 pounds per year**
- B) 429 pounds per year
- C) 457 pounds per year
- D) 466 pounds per year

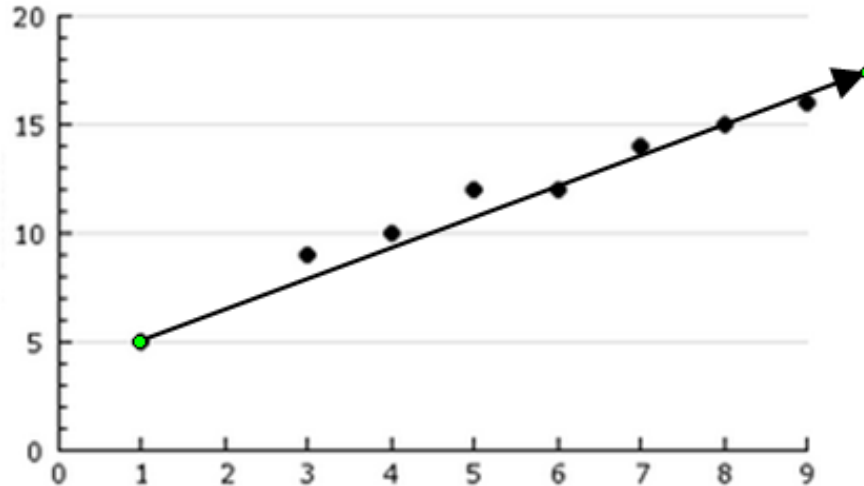
**Explanation:**

To find the rate of change, find the total change in weight and then divide it by number of years over which it changed. So the

answer is  $\frac{2800}{7}$  which is **400 pounds per year.**

11)

Share Value (Jan.- Sept.)



The graph represents the current stock market trends. The best fit line shows

- A) no correlation
- B) weak positive correlation
- C) weak negative correlation
- D) **strong positive correlation**

**Explanation:**

**strong positive** The slope of the line is positive. Most of the points lie close to the line.

12) The price of bananas went from \$0.20 per lb to \$0.60 per lb in four years. Find the rate of change of the price of bananas.

- A) \$0.05 per pound per year
- B) \$0.10 per pound per year**
- C) \$0.15 per pound per year
- D) \$0.25 per pound per year

**Explanation:**

To find the rate of change, find the total change in price and then divide it by number of years over which it changed. So the answer is  $\frac{\$0.40}{4}$  which is **\$0.10 per pound per year**.

13) The price of oranges went from \$.90 per lb to \$1.20 per lb in five years. Find the rate of change of the price of oranges.

- A) \$0.30 per pound per year
- B) \$0.06 per pound per year**
- C) \$0.24 per pound per year
- D) \$0.18 per pound per year

**Explanation:**

To find the rate of change, find the total change in price and then divide it by number of years over which it changed. So the answer is  $\frac{\$0.30}{5}$  which is **\$0.06 per pound per year**.

14) A machine can fill a box with twenty pencils in 30 seconds. How many boxes can the machine fill in 2 hours?

- A) 2 boxes
- B) 120 boxes
- C) 240 boxes**
- D) 2400 boxes

**Explanation:**

If the machine can fill one box in thirty seconds then that means that the machine can fill 2 boxes in a minute. Since there are 60 minutes in a hour that is 120 boxes in one hour. Therefore double that to find out how many boxes the machine can fill in 2 hours. The machine can fill **240 boxes**.

15) Eric sells shirts. It costs him \$100 to buy all the shirts and \$10, total, to print designs on them. Eric sells each shirt for \$4. So far he has sold 20 shirts. He uses the equation  $y = 4x - 110$  to calculate his profit.

What is the constant in Eric's equation?

- A) 4
- B) -10
- C) 20
- D) -110**

**Explanation:**

**-110**

Eric's equation is Profit =  $4x - (100 + 10)$

**16)** Carrie saved money to spend while on a one-month vacation to Europe. On day 8, she had \$2,400 remaining. On day 16, she had \$1,600 remaining.

If her spending is modeled by a linear function, how much money did she initially take with her to Europe?

- A) \$3,000
- B) \$3,100
- C) \$3,200**
- D) \$3,600

**Explanation:**

**\$3,200**

$$\text{slope} = \frac{1,600 - 2,400}{16 - 8} = -100$$

$$y = mx + b$$

$$2,400 = -100(8) + b$$

$$b = 3,200$$

thus,

$$y = mx + b$$

$$y = -100x + 3,200$$

$$y = -100(0) + 3,200$$

$$y = 3,200$$

**17)** In the function  $y = 15.00x + 5$ ,  $y$  represents the cost of a ticket to the fair and  $x$  represents the number of tickets purchased. How much does the cost increase for every ticket purchased?

- A)  $x$
- B) \$5.00
- C) \$15.00**
- D) \$20.00

**Explanation:**

**\$15.00** is correct. The slope is the coefficient in front of  $x$ . Since the slope of the equation is 15.00, the ticket cost increases \$15.00 per person.



**18)** Hank started a savings account in June of 2002. On June 2006, he had \$3,800. On June 2014, he had \$8,600. If Hank's saving is modeled by a linear function, what was his initial deposit?

- A) \$1,100
- B) \$1,300
- C) \$1,400**
- D) \$700

**Explanation:**

**\$1,400**

$$\text{slope} = \frac{8,600 - 3,800}{2014 - 2006} = 600$$

$$y = mx + b$$

$$3,800 = 600(2006) + b$$

$$b = -1,199,800$$

thus,

$$y = mx + b$$

$$y = 600x - 1,199,800$$

$$y = 600(2002) - 1,199,800$$

$$y = 1,400$$

**19)** Tara's car accelerated from 10 miles per hour to 60 miles per hour in 12 seconds.

What is the approximate rate of change in the miles per hour that Tara's car accelerated?

- A) 4 miles per hour per second**
- B) 5 miles per hour per second
- C) 18 miles per hour per second
- D) 48 miles per hour per second

**Explanation:**

To find the rate of change, find the total change in speed and then divide it by number of seconds over which it changed. So the

answer is  $\frac{50}{12}$  which is approximately **4 miles per hour per second**.

20) Mark partially drained his pool to clean it. At 1:00 P.M., he started to refill it. At 5:00 P.M., the pool had 10,400 gallons of water. At 9:00 P.M., the pool had 13,800 gallons of water. If filling the pool is modeled by a linear function, how many gallons of water still remained in the pool when he first started to refill it?

- A) 6,150
- B) 6,500
- C) **7,000**
- D) 7,150

**Explanation:**

**7,000**

First, find the slope

$$\text{slope} = \frac{10,400 - 13,800}{9 - 5} = 850$$

Then, find the y-intercept

$$y = mx + b$$

$$10,400 = 850(5) + b$$

$$b = 6,150$$

$$y = mx + b$$

$$y = 850(1) + 6,150$$

$$y = 7,000$$

21) The apartment complex where Stacy lives has increased the rent by \$150 every year. When she first rented there 3 years ago, it cost her \$600 for a one-bedroom apartment.

What will be the rent five years from now?

- A) \$1,050
- B) \$1,350
- C) **\$1,800**
- D) \$1,950

**Explanation:**

Rent from when she first rented there can be modeled by the function  $\text{rent} = 150(\text{number of years}) + 600$ . Five years from now means she will have been there for 8 years so plug 8 in for number of years and the rent is **\$1,800**

22) An airplane has begun its descent for a landing. When the airplane is 150 miles west of its destination, its altitude is 32,000 feet. When the airplane is 100 miles west of its destination, its altitude is 14,000 feet. If the airplane's descent is modeled by a linear function, where will the airplane be in relation to the runway when it hits ground level?

- A) airplane will over shoot the runway by 61 feet
- B) airplane will over shoot the runway by 610 feet
- C) airplane will land short of the runway by 61 feet**
- D) airplane will land short of the runway by 6.1 feet

**Explanation:**

**airplane will land short of the runway by 61 feet**

$$\text{slope} = \frac{32,000 - 14,000}{150 - 100} = 360$$

$$y = mx + b$$

$$32,000 = 360(150) + b$$

$$32,000 - 54,000 = b$$

$$b = -22,000$$

thus,

$$y = mx + b$$

$$0 = 360x - 22,000$$

$$22,000 = 360x$$

$$x = 61.111$$

When the plane is at ground level ( $y = 0$ ), it will be 61 feet from the runway.

23) Casey is reading a book for a book report. At 3:30 P.M., he started reading where he had left off the day before. At 5:30 P.M. he was on page 160. At 8:00 P.M. he was on page 280. If reading the book is modeled by a linear function, what page did Casey start on at 3:30 P.M.?

- A) 60
- B) 64**
- C) 70
- D) 74

**Explanation:**

**64**

$$\text{slope} = \frac{280 - 160}{8 - 5.5} = 48$$

$$y = mx + b$$

$$280 = 48(8) + b$$

$$b = -104$$

thus,

$$y = mx + b$$

$$y = 48x - 104$$

$$y = 48(3.5) - 104$$

$$y = 64$$

24) Fatimah is planning for retirement. Starting May 2014 she puts \$250 per month into her retirement account. Each January and July she plans on increasing her monthly contribution by \$50. How much will she be putting in per month in September 2024?

- A) \$1,200
- B) \$1,250
- C) **\$1,300**
- D) \$1,350

**Explanation:**

Write an equation to model the amount of money she puts in each January. So starting January of 2015 she will be putting in \$350 dollars a month (from May of 2014 she increased by \$50 in July and then another \$50 in January). Let  $x$  represent the years since 2015

$$y = 100x + 350.$$

Since 2024 is 9 years since 2015. Then in January of 2015 she will be putting in  $y = 100(9) + 350 = \$1,250$ . In July she will add another \$50 so she will be putting in **\$1,300** a month in September of 2024.

25) Maggy started a savings account in March of 2003. On March 2007, she had \$4,200. On March 2015, she had \$10,400. If Maggy's saving is modeled by a linear function, what was her initial deposit?

- A) **\$1,100**
- B) \$1,300
- C) \$1,500
- D) \$700

**Explanation:**

**\$1,100**

$$\text{slope} = \frac{10,400 - 4,200}{2015 - 2007} = 775$$

$$y = mx + b$$

$$4,200 = 775(2007) + b$$

$$b = -1,551,225$$

thus,

$$y = mx + b$$

$$y = 775x - 1,551,225$$

$$y = 775(2003) - 1,551,225$$

$$y = 1,100$$

**26)** Mark is draining his pool to clean it. At 2:00 P.M., he started to drain the pool. At 4:00 P.M., the pool had 11,600 gallons of water. At 7:00 P.M., the pool had 6,800 gallons of water. If draining the pool is modeled by a linear function, how many gallons of water were initially in the pool?

- A) 13,800
- B) 14,800**
- C) 15,000
- D) 16,400

**Explanation:**

**14,800**

$$\text{slope} = \frac{6,800 - 11,600}{7 - 4} = -1,600$$

$$y = mx + b$$

$$11,600 = -1,600(4) + b$$

$$b = 18,000$$

thus,

$$y = mx + b$$

$$y = -1600x + 18,000$$

$$y = -1600(2) + 18,000$$

$$y = 14,800$$

**27)** An airplane has begun its descent for a landing. When the airplane is 150 miles west of its destination, its altitude is 25,000 feet. When the airplane is 90 miles west of its destination, its altitude is 19,000 feet. If the airplane's descent is modeled by a linear function, where will the airplane be in relation to the runway when it hits ground level?

- A) airplane will over shoot the runway by 100 feet**
- B) airplane will over shoot the runway by 1000 feet
- C) airplane will land short of the runway by 10 feet
- D) airplane will land short of the runway by 100 feet

**Explanation:**

**airplane will over shoot the runway by 100 feet**

$$\text{slope} = \frac{25,000 - 19,000}{150 - 90} = 100$$

$$y = mx + b$$

$$25,000 = 100(150) + b$$

$$25,000 - 15,000 = b$$

$$b = 10,000$$

thus,

$$y = mx + b$$

$$0 = 100x + 10,000$$

$$-10,000 = 100x$$

$$x = -100$$

When the plane is at ground level ( $y = 0$ ), it will be 100 feet past the end of the runway.