



## Coordinate Algebra EOC (GSE) Quiz Answer Key

Functions - (MGSE9-12.F.BF.1) Write A Function

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

1) The cost of tuition at Johnson Community College is \$160 per credit hour. Each student also has to pay \$50 in fees. Model the cost,  $C$ , for  $x$  credit hours taken.

- A)  $C(x) = 50x$
- B)  $C(x) = 160x$
- C)  $C(x) = 110x$
- D)  $C(x) = 160x + 50$

**Explanation:**

$C(x) = 160x + 50$  is correct, since the \$50 cost is fixed, but the \$160 cost increases as  $x$  increases.

2) Cathy pays \$25 a month plus \$0.05 per text message. She models this with the function  $C = 0.05x + 25$ . If the text messaging fee increases to \$0.10, what is her new function?

- A)  $C = 10x + 25$
- B)  $C = 0.10x + 25$
- C)  $C = 0.10x + 0.05$
- D)  $C = 0.05x + 0.10$

**Explanation:**

The monthly fee is the  $y$ -intercept and the text messaging fee is the slope. The correct answer is  $C = 0.10x + 25$ .

3) The cost, in dollars, of a one-day car rental is given by  $C(x) = 31 + 0.18x$ , where  $x$  is the number of miles driven. In this function,

- A) \$0.18 is the cost per day to rent the car and \$31 is the cost per mile.
- B) **\$31 is the cost per day to rent the car and \$0.18 is the cost per mile.**
- C) \$18 is the cost per day to rent the car and \$0.31 is the cost per mile.
- D) \$31 is the cost per day to rent the car and \$18 is the extra cost for unlimited miles.

**Explanation:**

**\$31 is the cost per day to rent the car and \$0.18 is the cost per mile.** The \$31 cost is fixed, then 18 cents is added for each mile driven.

4)

Gary is 3 years older than twice the age of his sister (Elena) \_\_\_\_\_.

Which shows an equation for this situation?

- A)  $G = 6E$
- B)  **$G = 2E + 3$**
- C)  $E = 3G + 2$
- D)  $G = 3E + 2$

**Explanation:**

We do not know his current age so we give that the variable  $G$ . His sister will be  $E$ . twice the age of his sister is  $2E$ , add to that 3 years and get the equation  $G = 2E + 3$

5) Katherine has \$140 in the bank and is saving \$6 per week. Abbie has \$462 in the bank, but is spending at a rate of \$10 per week. Which equation will determine when they will have the same amount of money in the bank?

- A)  $140 + 6x = 462 + 10x$   
**B)  $140 + 6x = 462 - 10x$**   
 C)  $140 + 10x = 462 - 6x$   
 D)  $140 - 6x = 462 + 10x$

**Explanation:**

The words per week represents the variable in both cases. Since Katherine is *saving* her money the expression is  $140 + 6x$ . Abbie's expression is  $462 - 10x$  since she is *spending* her money each week. Set the two expressions equal to each other to get  **$140 + 6x = 462 - 10x$** .

6) Jeff volunteers his time by working at an animal shelter. Each year he works for a total of 240 hours. So far this year, he has worked 97 hours. Which equation will solve for how many more hours ( $h$ ) Jeff will volunteer for?

- A)  $97 = 240 + h$   
 B)  $97 = 240h$   
**C)  $240 = 97 + h$**   
 D)  $240 = 97 - h$

**Explanation:**

**$240 = 97 + h$**  will solve for how many hours Jeff will work for.  $240 - 97 = h$ ,  $h = 143$

7)

<b>x</b>	1	2	3	4	5
<b>f</b>	4	7	10	13	16

Given the table for  $f(x)$ , write an expression for the function, and describe what it does.

- A)  $y=2x$ .  $y$  is double  $x$ .  
 B)  $y=3x$ .  $y$  is triple  $x$ .  
**C)  $y=3x + 1$ .  $y$  is three times  $x$  plus 1.**  
 D)  $y=3x - 1$ .  $y$  is three times  $x$  minus 1.

**Explanation:**

The correct answer is  **$y=3x + 1$ .  $y$  is three times  $x$  plus 1.** Each value of  $f$  is triple that of the corresponding value of  $x$ , plus 1.

8) Luke is trying to lose weight. He currently weighs 250 lbs and is planning on losing 4 lbs a week. This can be modeled by the function

$f(x) = -4x + 250$ . His goal is to have lost 50 lbs in 10 weeks. Is this possible? If not, what does he need to change?

- A) It is possible.  
 B) It is not possible. He needs to lose at least 6 lbs a week.  
**C) It is not possible. He needs to lose at least 5 lbs a week.**  
 D) It is not possible. He needs to lose at least 3 lbs a week.

**Explanation:**

If you change the slope to  $-5$ , and plug 10 in for  $x$ ,  $f(x)$  is 200. So, **it is not possible. He needs to lose at least 5 lbs a week.**

9)

<b>x</b>	1	2	3	4	5
<b>f</b>	3	5	7	9	11

Given the table for  $f(x)$ , write an expression for the function, and describe what it does.

- A)  $y=2x$ .  $y$  is double  $x$ .
- B)  $y=3x$ .  $y$  is triple  $x$ .
- C)  **$y=2x + 1$ .  $y$  is twice  $x$  plus 1.**
- D)  $y=2x - 1$ .  $y$  is twice  $x$  minus 1.

**Explanation:**

The correct answer is  **$y=2x + 1$ .  $y$  is double  $x$  plus 1.** Each value of  $f$  is twice that of the corresponding value of  $x$ , plus 1.

10)

<b>x</b>	1	2	3	4	5
<b>f</b>	2	4	6	8	10

Given the table for  $f(x)$ , write an expression for the function, and describe what it does.

- A)  **$y = 2x$ ;  $y$  is double  $x$ .**
- B)  $y = 3x$ ;  $y$  is triple  $x$ .
- C)  $y = 2x + 1$ ;  $y$  is twice  $x$  plus 1.
- D)  $y = 2x - 1$ ;  $y$  is twice  $x$  minus 1.

**Explanation:**

The correct answer is  **$y = 2x$ ;  $y$  is double  $x$ .** Each value of  $f$  is twice that of the corresponding value of  $x$ .

11)

<b>x</b>	1	2	3	4	5
<b>f</b>	3	6	9	12	15

Given the table for  $f(x)$ , write an expression for the function, and describe what it does.

- A)  $y = 2x$ .  $y$  is double  $x$ .
- B)  **$y = 3x$ .  $y$  is triple  $x$ .**
- C)  $y = 2x+1$ .  $y$  is twice  $x$  plus 1.
- D)  $y = 2x-1$ .  $y$  is twice  $x$  minus 1.

**Explanation:**

The correct answer is  **$y=3x$ .  $y$  is triple  $x$ .** Each value of  $f$  is triple that of the corresponding value of  $x$ .

12)

**Bryce grows at a rate five times as fast as Drew.**

Which algebraic equation best represents Bryce's growth rate?

- A)  $B = D$
- B)  **$B = 5D$**
- C)  $B = 5 + D$
- D)  $D = 5B$

**Explanation:**

The expression that best represents the phrase is  **$B=5D$** . Bryce's growth rate is equal to five times Drew's growth rate.

13) Every week ( $w$ ) Sandra will save \$10. Which algebraic expression could Sandra use to calculate how much money she has saved after any number of weeks?

- A)  $10w$
- B)  $10^x$
- C)  $10 + w$
- D)  $\frac{10}{w}$

**Explanation:**

Sandra should use the expression  $10w$ . In this situation, Sandra wants to multiply the number of weeks by \$10.

14)

<b>x</b>	1	2	3	4	5
<b>f</b>	4	8	12	16	20

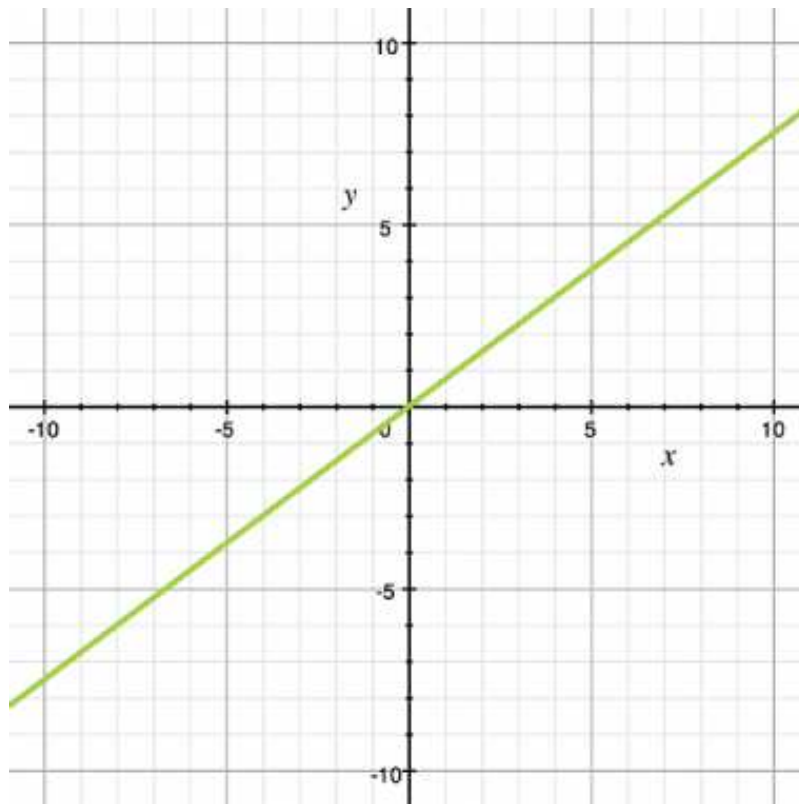
Given the table for  $f(x)$ , write an expression for the function, and describe what it does.

- A)  $y=2x$ .  $y$  is double  $x$ .
- B)  $y=3x$ .  $y$  is triple  $x$ .
- C)  **$y=4x$ .  $y$  is 4 times  $x$ .**
- D)  $y=2x+1$ .  $y$  is twice  $x$  plus 1.

**Explanation:**

The correct answer is  **$y=4x$ .  $y$  is 4 times  $x$** . Each value of  $f$  is quadruple that of the corresponding value of  $x$ .

15)



The amount of money Susan earns ( $y$ ) for every magazine she sells ( $x$ ) is shown on the graph. Which equation could Susan use to calculate the amount of money she earns for any number of magazines she sells?

- A)  $y = \frac{3}{4}x$
- B)  $y = \frac{4}{3}x$
- C)  $y = \frac{2}{3}x$
- D)  $y = -\frac{3}{4}x$

**Explanation:**

For every one magazine Susan sells she earns \$0.75. This is modeled by the equation  $y = \frac{3}{4}x$ . It might help to look at how much she earns if she sells 4 magazines. When she sells 4 she earns \$3. This is \$0.75 per magazine.

**16)** A theater sells adult tickets for \$8.00 and children's tickets for \$5.50. Sally bought some of each kind (not the same number) and paid a total of \$78.50. Which equation represents this situation?

- A)  $x + y = 78.5$
- B)  $13.5x = 78.5$
- C)  $13.5xy = 78.5$
- D)  $8x + 5.5y = 78.5$

**Explanation:**

$8x + 5.5y = 78.5$  is correct. If  $x$  is the number of adult tickets purchased,  $8x$  is the money spent on them. If  $y$  is the number of children's tickets, then  $5.5y$  is the money spent on them. Add these numbers to get 78.5.

**17)** A city had population 67,255 on January 1, 2000, and its population has been increasing by 2935 people each year since then. A linear model for the population  $P$ , where  $t$  is in years after 2000, is

- A)  $P(t) = 2935t$ .
- B)  $P(t) = 67255t$ .
- C)  $P(t) = 2935 + 67255t$ .
- D)  $P(t) = 67255 + 2935t$ .

**Explanation:**

$P(t) = 67255 + 2935t$  is correct. The figure 67255 does not change, while 2935 is added each time  $t$  increases.

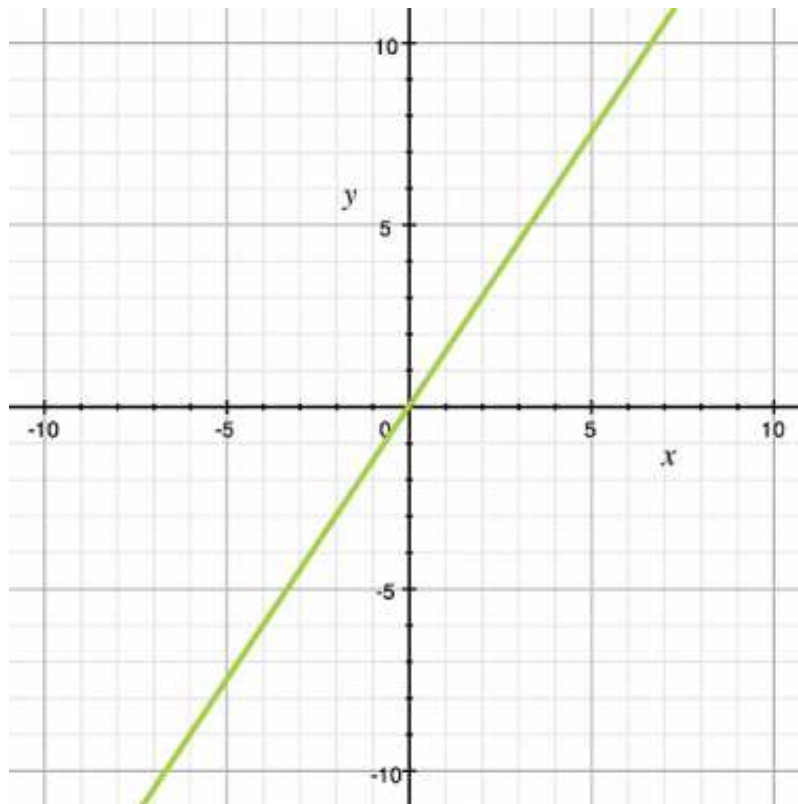
**18)** Chris has \$100 in his savings account and he adds \$20 a month to the account. The total amount can be represented by the linear function  $T = 20x + 100$ . His goal is to have a total of \$300 in four more months. What should he change in the function to reach this goal?

- A) **Change the amount he adds each month to \$50.**
- B) Change the amount he adds each month to \$40.
- C) Change the y-intercept of the linear function to \$20.
- D) Change the y-intercept of the linear function to \$50.

**Explanation:**

**Change the slope or amount he adds each month to \$50.** With a slope of \$50, Chris will add \$200 to his account over 4 months. This will give him a total of \$300 in the account.

19)



The graph shows the cost ( $y$ ) to mail a package of any weight ( $x$ ). Which equation could be used to calculate the cost to mail a package of any weight?

- A)  $y = \frac{3}{2}x$
- B)  $y = \frac{2}{3}x$
- C)  $y = \frac{4}{5}x$
- D)  $y = -\frac{3}{2}x$

**Explanation:**

It costs \$3 to mail 2 packages. So it is \$1.50 to mail 1 package. This can be calculated by using the equation  $y = \frac{3}{2}x$

**20)** Charlie's weight is nine kilograms greater than his brother's. Together they weigh 99 kilograms. Let  $x$  represent the weight of the little brother. Which equation can be used to determine what each one weighs?

- A)  $x^2 + 9 = 99$
- B)  $2x - 9 = 99$
- C)  $2x + 9 = 99$
- D)  $3x - 9 = 99$

**Explanation:**

Charlie's weight is represented by the expression  $x+9$ . Since the equation needs their weights totaled, you must add  $x$  and  $x+9$  and set it equal to 99 to get  $2x + 9 = 99$

21)

In	Out
5	2
6	4
7	6
8	8
9	10
10	12
11	14

The table shows x-values going in and y-values coming out. The function being used is

- A)  $f(x) = 2x$
- B)  $f(x) = x - 3$
- C)  $f(x) = x - 8$
- D)  $f(x) = 2x - 8$**

**Explanation:**

$y = 2x - 8$  is correct. This can be found by testing several x-values to produce the expected y-values.

22)

Time (in minutes)	Number of Problems in Set
30	36
40	48
50	60
60	72

The time it took Tanya to complete different sets of math problems varied directly with the number of problems in the set. Tanya's data is shown in the table. If  $x$  = time, and  $y$  = the number of problems in the set, which equation models Tanya's direct variation?

- A)  $y = 12x$
- B)  $y = 1.2x$**
- C)  $y = x + 12$
- D)  $y = x + 1.2$

**Explanation:**

$y = 1.2x$  Multiply the time by 1.2 to get the number of problems in the set.



23)

## Cookies and price

b	c
4	12
6	18
9	27

The table shows the cost,  $c$ , of buying each number of boxes,  $b$ , of cookies. Write an equation that models this situation.

- A)  $b = 3c$   
**B)  $c = 3b$**   
 C)  $b = 8c$   
 D)  $c = 8b$

**Explanation:**

Each box of cookies is \$3 since  $4 \times 3 = 12$ ,  $6 \times 3 = 18$ , and  $9 \times 3 = 27$ . So we want to multiply the number of boxes,  $b$ , by 3 to get the cost,  $c$ . The correct equation is  **$c = 3b$** .

24)

x	1	2	3	4	5
f	2	5	8	11	14

Given the table for  $f(x)$ , write an expression for the function, and describe what it does.

- A)  $y = 2x$ .  $y$  is double  $x$ .  
 B)  $y = 3x$ .  $y$  is triple  $x$ .  
 C)  $y = 3x + 1$ .  $y$  is three times  $x$  plus 1.  
**D)  $y = 3x - 1$ .  $y$  is three times  $x$  minus 1.**

**Explanation:**

The correct answer is  **$y = 3x - 1$ .  $y$  is three times  $x$  minus 1**. Each value of  $f$  is triple that of the corresponding value of  $x$ , minus 1.

25)

## Distance and Time

t	d
3	180
4	240
6	360

The table shows the distance,  $d$ , traveled in the number of hours  $t$ . Write an equation to model this situation.

- A)  $d = 60t$**   
 B)  $t = 60d$   
 C)  $d = 120t$   
 D)  $t = 120d$

**Explanation:**

The rate is 60 miles per hour since  $180/3 = 60$ ,  $240/4 = 60$ , and  $360/6 = 60$ . So we want to multiply the number of hours we have traveled,  $t$ , by 60 to get the distance,  $d$ . The correct equation is  **$d = 60t$** .

