



Level 4: Functions Pretest Answer Key

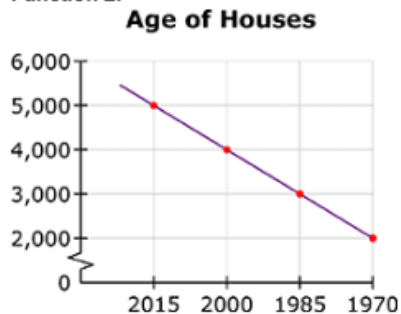
Question 1:

The following equation and graph describe two functions used by tax assessors to determine the value of a house.

Function 1:

Number of Bedrooms Formula $y = \frac{1}{2}x + 1$

Function 2:



Which statement is true?

- a. Function 1 is decreasing and function 2 is increasing.
- b. Function 2 is decreasing and function 1 is increasing.**
- c. Both functions are decreasing.
- d. Both functions are increasing.

Question 2:

Function 1: The tax assessor calculates the square footage of a building using the function $y = x^2$.

Function 2: The tax assessor calculates the increase in property value due to the number of bathrooms using the function $y = 10,000x$.

Which function is linear?

- a. Function 2**
- b. Function 1
- c. Both functions are linear.
- d. Neither function is linear.



Question 3:

The table shows the price of five different houses in a new housing development. All of the houses have the same basic price. Each special feature adds an equal amount to the cost of the house.

| House | Special Feature | Cost |
|-------|---|-----------|
| 1 | None | \$210,000 |
| 2 | Garage and swimming pool | \$250,000 |
| 3 | Finished basement | \$230,000 |
| 4 | Fireplace, garage, and swimming pool | \$270,000 |
| 5 | Garage, finished basement, fireplace, and swimming pool | \$290,000 |

Write a function to show the relationship between the number of special features (x) and the purchase price (y). (Do not include dollar signs in your function.)

Question 4:

Which set of ordered pairs (x , y) does not describe a function of x ?

- a. $\{(0, 4), (1, 4), (2, 4), (3, 4), (4, 4)\}$
- b. $\{(0, 0), (1, 1), (2, 2), (3, 3), (4, 4)\}$
- c. $\{(4, 0), (4, 1), (4, 2), (4, 3), (4, 4)\}$
- d. $\{(0, 4), (1, 3), (2, 2), (3, 1), (4, 0)\}$

Question 5:

This table shows some pairs of values for a linear function.

| | | | | | |
|-----|----|----------------|---|----------------|---|
| x | -2 | -1 | 0 | 1 | 2 |
| y | 4 | $3\frac{1}{2}$ | 3 | $2\frac{1}{2}$ | 2 |

A different linear function is defined by this equation.

$$y = -2x.$$

Which statement is true regarding the two functions?

- a. The y -intercept of both functions is 0.
- b. The y -intercept of both functions is not 0.
- c. As the values of x increase, both functions increase in value.
- d. As the values of x increase, both functions decrease in value.



Question 6:

Joanna is using these formulas to solve a geometry problem.

$$A = x(2x)$$

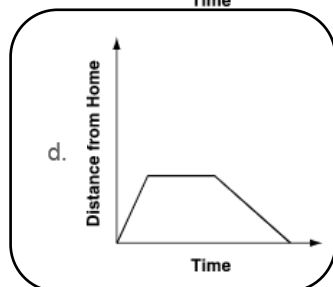
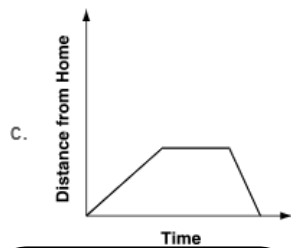
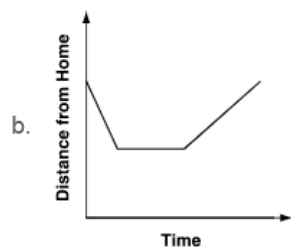
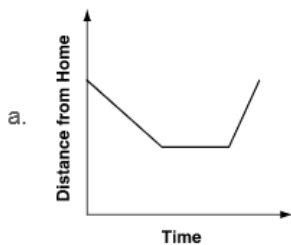
$$P = 2x + 2(2x)$$

Which formula represents a linear function?

- a. both formulas
- b. neither formula
- c. only the formula $A = x(2x)$
- d. only the formula $P = 2x + 2(2x)$

Question 7:

Maci left home and rode her bicycle at a fast speed to a park, where she stopped and talked to a friend for a few minutes. Then she rode home at a slower speed. Which graph best shows how Maci's distance from home changed over time?



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Question 8:

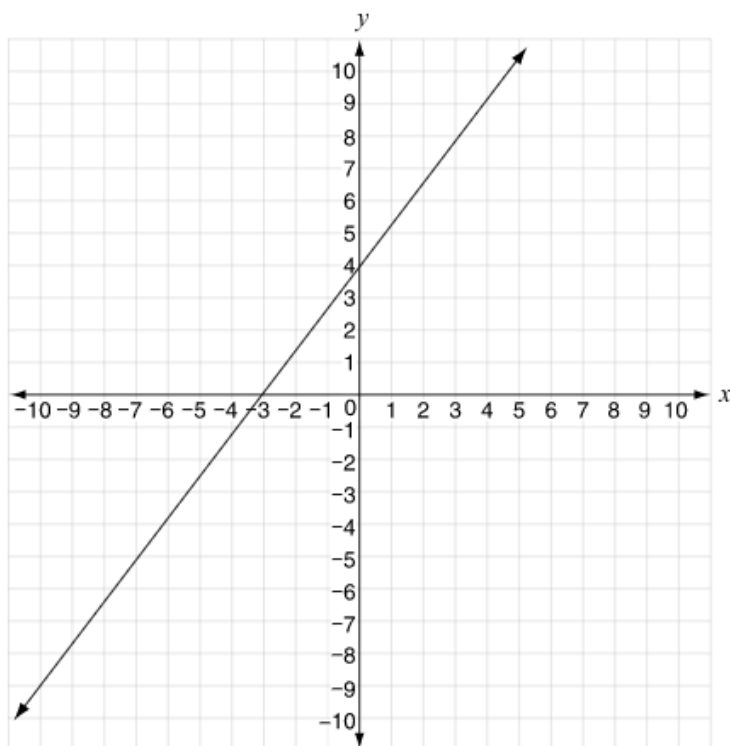
A truck driver is traveling home at an average speed of 50 miles per hour from a distance of 300 miles away.

Write an equation to show the relationship between t , the number of hours the truck driver travels, and d , his distance from home.

$$d = 300 - 50t$$

Question 9:

The coordinate plane below shows the graph of a linear function. The line passes through the points $(-3, 0)$ and $(0, 4)$.



Another linear function has the equation $y = ax$, where a is a rational number. The two functions have the same rate of change. What is the value of a ?

$$a = \frac{4}{3}$$



Question 10:

Two functions are used to solve a problem.

- Function A is represented by $y = 3x + 10$.
- Function B is represented by this table of values.

| x | y |
|-----|-----|
| 0 | 4 |
| 1 | 13 |
| 2 | 22 |
| 3 | 31 |

Which statement explains which function has the greatest rate of change?

- a. Function A has the greatest rate of change because $10 > 4$.
- b. Function B has the greatest rate of change because $4 > 3$.
- c. Function A has the greatest rate of change because $10 > 13 - 4$.
- d. Function B has the greatest rate of change because $13 - 4 > 3$.

Question 11:

Which function has the greatest rate of change?

- a. $y = 6x + 13$
- b. $y = 10x + 1$
- c. $y = 12 + 3x$
- d. $y = 11 + 9x$

Question 12:

Which sets could not be the domain and range of a function?

- a. $\{-4, -3, -2, -1, 1, 2, 3, 4\}$ is the domain and $\{1, 2, 3, 4\}$ is the range
- b. $\{1, 2, 3, 4\}$ is the domain and $\{-4, -3, -2, -1, 1, 2, 3, 4\}$ is the range
- c. $\{1, 2, 3, 4\}$ is the domain and $\{6, 7, 8, 9\}$ is the range
- d. $\{6, 7, 8, 9\}$ is the domain and $\{1, 2, 3, 4\}$ is the range



Question 13:

A function contains the ordered pairs (0, 3), (6, 1), and (9, 0). Which statement explains whether or not the function is linear?

- a. The function is linear because it has both x - and y -intercepts.
- b. The function is linear because it has a constant rate of change.**
- c. The function is not linear because the difference in the x -coordinates is not constant.
- d. The function is not linear because the y -coordinate is not a constant multiple of the x -coordinate.

Question 14:

Becky writes the equation $y = 2x + 1$.

Matt makes this table of values.

| x | y |
|-----|-----|
| 0 | 2 |
| 1 | 4 |
| 2 | 8 |
| 3 | 32 |

Which statement is true about the functions?

- a. They represent the same function.
- b. One is linear; one is nonlinear.**
- c. Both functions are linear.
- d. Both functions are nonlinear.

Question 15:

A linear function has a slope of 2 and a y -intercept of 3. What is the y -value of the function when $x = 8$?

$y =$