Level 4: Functions Post-Test

Question 1:

The table shows the cost to buy houses of various sizes.

Cost and House Size

x = Cost (thousands)	y = Size (sq ft)
100	500
200	1,000
300	1,500
400	2,000
500	2,500

Write a function that represents the relationship between cost (x) and size (y).

Question 2:

An assessor uses the base home value of $80,000 plus $500 for each bedroom to determine the assessed value of a home.

Which formula defines this linear function?

a. $y = x + 500$

b. $y = 500x$

c. $y = 500x + 80{,}000$

d. $y = 80{,}000x + 500$

Question 3:

Which table can be represented by a function?

Table 1

x	y
0	0
1	1
1	−1
4	2
4	−2

Table 2

x	y
12	12
12	−12
−24	24
25	25
−30	30

Table 3

x	y
0	5
1	6
2	7
3	8
4	9

a. Table 1

b. Table 2

c. Table 3

d. None of the tables represent a function.

Question 4:

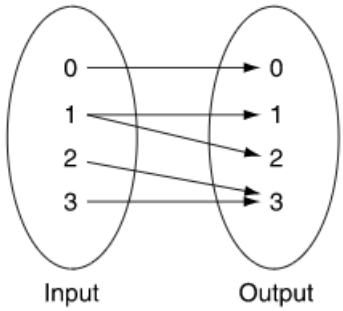
The city assesses $3,000 for each special feature of a home, such as a pool, or a garage. The table shows the relationship between special features and assessment value.

x = Special Feature	y = $ (in thousands)
2	6
4	12
6	18
8	24

Write a function to show the relationship between special features (x) and dollars (y).

Question 5:

This mapping diagram defines a relation.



Which of the following best explains why this relation is not a function?

a. The range includes 0.

b. The domain includes 0.

c. One input value is mapped to two different output values.

d. Two different input values are mapped to the same output value.

Question 6:

Which set of ordered pairs defines a function that is not linear?

a. {(0, 4), (1, 7), (2, 10), (3, 13)}

b. {(0, 4), (1, 8), (2, 11), (3, 13)}

c. {(0, 12), (1, 11), (2, 10), (3, 9)}

d. {(0, 12), (1, 12), (2, 12), (3, 12)}

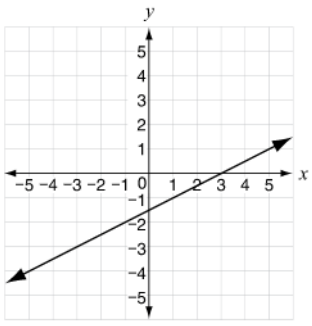
Question 7:

This equation and this graph describe two different functions.

Function 1

$y = \frac{1}{3}x + 2$

Function 2



Which statement best compares the slopes and y-intercepts of the two functions?

a. Function 1 has a greater slope and greater y-intercept than Function 2.

b. Function 2 has a greater slope and greater y-intercept than Function 1.

c. Function 1 has a greater slope and lesser y-intercept than Function 2.

d. Function 2 has a greater slope and lesser y-intercept than Function 1.

Question 8:

Julia and Sophie are comparing their reading rates. This table and this equation show the relationship between t, the number of hours of reading, and n, the number of pages each girl reads.

Sophie's Reading $n = 35t$

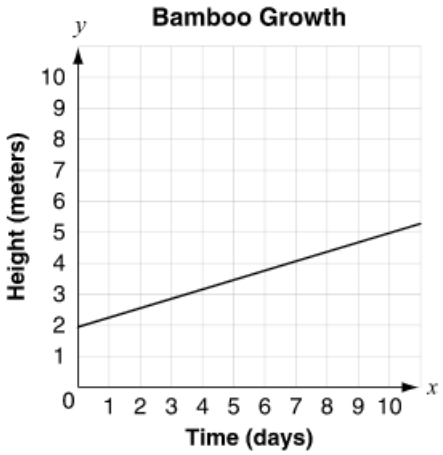
Julia's Reading

t	n
0	0
0.5	20
1.0	40
1.5	60
2.0	80

_____ is the faster reader and her rate is _____ pages per hour.

Question 9:

The graph below shows how the height of a bamboo plant is changing over time.



Which equation describes the relationship between x, the number of days, and y, the height of the plant in meters?

a. $y = 0.3x + 2$

b. $y = 0.3x + 5$

c. $y = 3x + 2$

d. $y = 3x + 5$

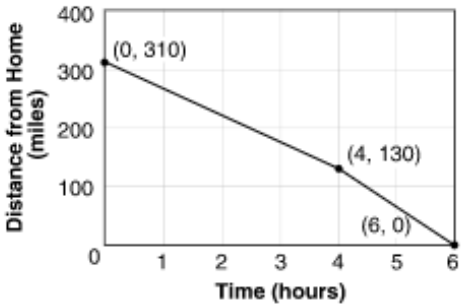
Question 10:

The following describes Jason's trip as he rode a bus home from college:

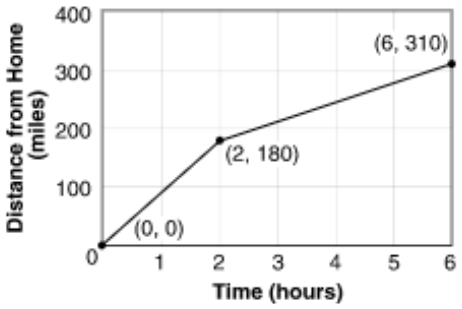
- The bus traveled a total distance of 310 miles.
- During the first part of the trip, the bus traveled at a constant speed of 45 miles per hour.
- Then the bus entered a highway and finished the second part of the trip in 2 hours, at a constant speed of 65 miles per hour.

Which graph represents Jason's trip on the bus, showing his distance from home as a function of time?

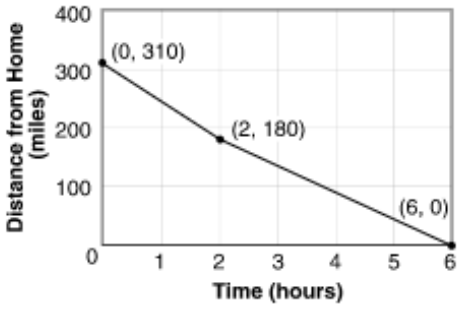
a.



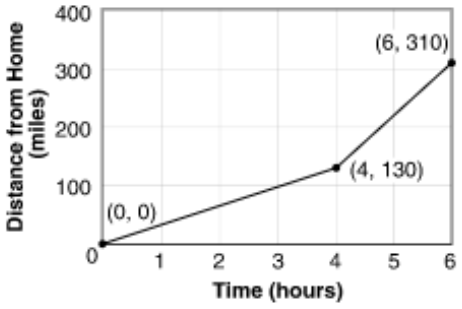
b.



c.



d.



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Question 11:

This set of ordered pairs defines a function.

$F = \{(0,2), (1,3), (2,4), (3,5)\}$

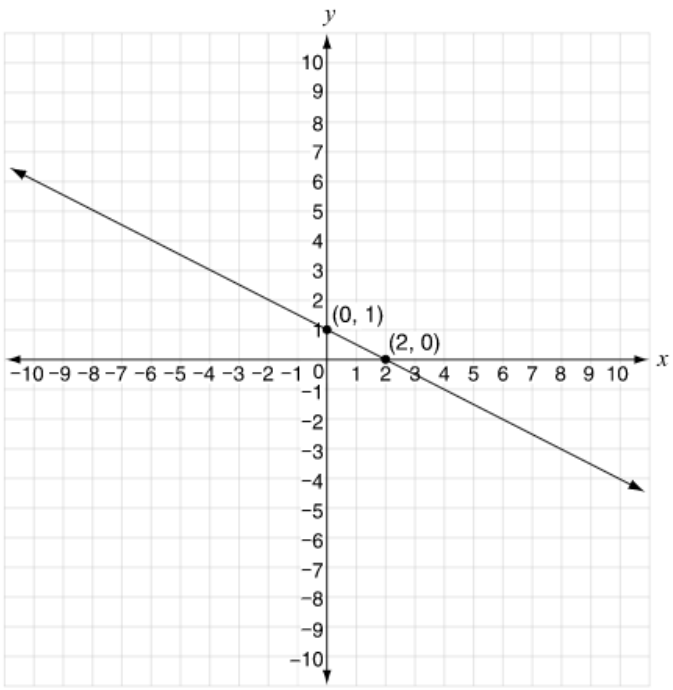
If the input value is 3, what is the output value?

Question 12:

Marty graphs a linear equation. The three points (–2, 10), (0, 8), and (5, k) lie on the graph. What is the value of k?

Question 13:

The coordinate plane below shows the graph of a linear function of x.



Write an equation to describe the function.

Continue

Question 14:

Marion stopped to buy gasoline for her car. The sign shown below lists the prices for two types of gasoline.

GAS	
Unleaded	$3.199
Unleaded Plus	$3.299

Marion is interested in how much money she would save buying unleaded gas instead of unleaded plus gas. Write an equation that shows the relationship between the number of gallons (g) of gas and the amount (A) in dollars Marion saves.

Question 15:

A botanist is studying the growth of a patch of algae in a pond. The diameter of the patch is increasing at a constant rate, as shown in the table below.

Growth of Algae in a Pond

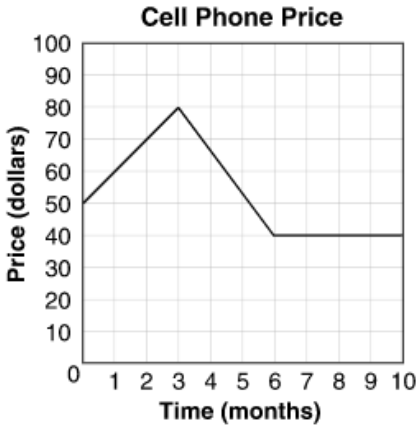
Time (days)	0	1	2	3	4
Diameter of Patch (meters)	0.5	4.5	8.5	12.5	16.5

Write an equation that represents the relationship between y, the diameter in meters of the algae patch, and x, the time in days.

Continue

Question 16:

The graph below shows how the price of a certain type of cell phone has changed over time.



Select the numbers that make the sentence true.

The price of the cell phone was decreasing between months [ ] and [ ]

Question 17:

Which coordinate pairs represent a function?

a. (3, 4), (5, 5), (–2, 5), (6, –8), (5, 1)

b. (3, 4), (4, 5), (–2, 5), (6, –8), (5, 1)

c. (3, 4), (4, 5), (–2, 5), (3, –8), (4, 1)

d. (3, 4), (4, 5), (–2, 5), (–2, –8), (4, 1)

Question 18:

John graphs the coordinate pairs (0, 0), (0, 1), and (1, 2). Which statement is true?

a. The values are represented by the function $y = x + 1$.

b. The values are represented by the function $y = 2x$.

c. The values do not represent a function because two points have the same x-value.

d. The values do not represent a function because two points have the same y-value.

Continue ➡

Question 19:

Lee graphs the function $y = 2x^2 + 1$. Which statement explains whether the function is linear?

a. It is linear because it has a slope and a y-intercept.

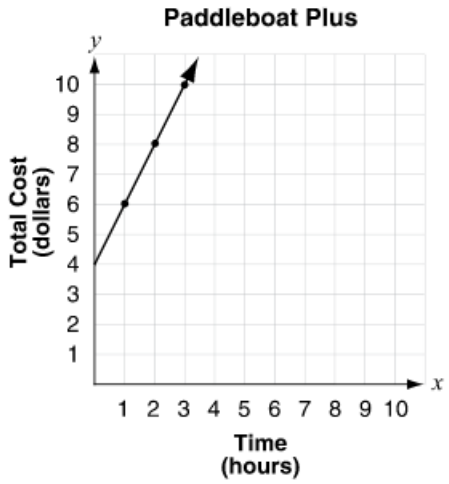
b. It is linear because all coefficients are positive.

c. It is not linear because the variable has an exponent of 2.

d. It is not linear because it can have more than one y-value for an x-value.

Question 20:

The costs of renting a paddleboat from two different companies are shown.



Water Fun Rentals

Time (hours)	Total Cost (dollars)
1	6
2	11
3	16

Which equation represents the rental cost of the company with the least expensive hourly rate?

a. $y = \frac{1}{2}x + 4$

b. $y = x + 5$

c. $y = 2x + 4$

d. $y = 5x + 1$

Continue

Question 21:

An electrician charges a set fee plus an hourly rate for a service call. The table shows the total cost of a service call based on the number of hours.

Electrician Charges

Hours	Total Cost
1	$135
2	$205
3	$275
4	$345

A plumber charges that same set fee for a service call, but charges a different hourly rate. Which equation could represent the total cost, y, of a plumber's service call that takes x hours?

a. $y = 60x + 75$

b. $y = 65x + 25$

c. $y = 70x + 45$

d. $y = 80x + 65$

Question 22:

These pairs of functions are represented by the equations and tables. Which pair of functions shows one increasing and one decreasing?

a.

$y = 2x + 3$

x	y
1	1
2	–1
3	–3

b.

$y = 2x + 1$

x	y
1	1
2	3
3	5

c.

$y = -2x - 1$

x	y
1	–1.5
2	–2
3	–2.5

d.

$y = x - 3$

x	y
1	–2
2	–1
3	0

Continue

Question 23:

Look at this equation.

$y = 5x$

Which table represents a function that does not have the same y-intercept as the equation?

a.

x	y
1	1
2	2
3	3

b.

x	y
1	3
2	6
3	9

c.

x	y
1	2
2	5
3	8

d.

x	y
1	4
2	8
3	12

Question 24:

Jim finds the areas of several squares and produces this table of values.

Side Length (inches)	Area (square inches)
1	1
2	4
3	9
4	16

Which statement explains whether or not this function is linear?

a. It is linear because the difference in the side lengths is constant.

b. It is linear because each value in the domain has only a single value in the range.

c. It is not linear because the rate of change is not constant.

d. It is not linear because the difference between area and side length is not constant.

Stop