Unit 5 Review

$y = ab^x$

$a = 3 \quad b = 3$

$y = 3(3)^x$

1. **Which table represents an exponential function?**

A.

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

B.

x	0	1	2	3	4
y	22	44	66	88	110

C.

x	0	1	2	3	4
y	5	13	21	29	37

D.

x	0	1	2	3	4
y	3	9	27	81	243

$\times 3$

2. **Which statement is true about the graphs of exponential functions?**

A. The graphs of exponential functions never exceed the graphs of linear and quadratic functions.

B. The graphs of exponential functions always exceed the graphs of linear and quadratic functions.

C. The graphs of exponential functions eventually exceed the graphs of linear and quadratic functions.

D. The graphs of exponential functions eventually exceed the graphs of linear functions but not quadratic functions.

3. **Which statement BEST describes the comparison of the function values for $f(x)$ and $g(x)$?**

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x	f(x)	g(x)
0	0	−10
1	2	−9
2	4	−6
3	6	−1
4	8	6

A. The values of $f(x)$ will always exceed the values of $g(x)$.

B. The values of $g(x)$ will always exceed the values of $f(x)$.

C. The values of $f(x)$ exceed the values of $g(x)$ over the interval $[0, 5]$.

D. The values of $g(x)$ begin to exceed the values of $f(x)$ within the interval $[4, 5]$.

4. **If the parent function is $f(x) = mx + b$, what is the value of the parameter m for the line passing through the points $(-2, 7)$ and $(4, 3)$?**

A. -9

B. $-\frac{3}{2}$

C. -2

D. $-\frac{2}{3}$

$\frac{y_2 - y_1}{x_2 - x_1}$

5. **Which function is modeled in this table?**

x	$f(x)$
1	8
2	40
3	200
4	1,000

A. $f(x) = x + 7$

B. $f(x) = 5x + 8$

C. $f(x) = (8)^x$

D. $f(x) = \frac{8}{5}(5)^x$

6. **If $f(12) = 4(12) - 20$, which function gives $f(x)$?**

A. $f(x) = 4x^2 - 20$

B. $f(x) = 4^x - 20$

C. $f(x) = 4x - 20$

D. $f(x) = 4x^2 + 12x - 20$

7. **A sample of 1,000 bacteria becomes infected with a virus. Each day, one-fourth of the bacteria sample dies due to the virus. A biologist studying the bacteria models the population of the bacteria with the function $P(t) = 1{,}000(0.75)^t$, where t is the time, in days.**

What is the range of this function in this context?

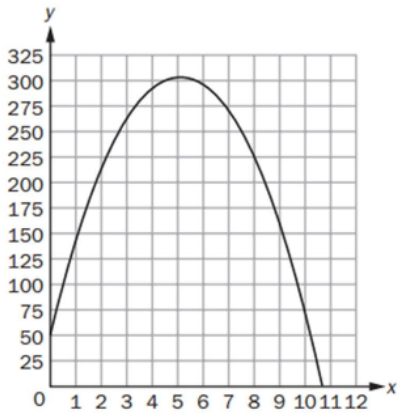
A. any real number such that $t \geq 0$

B. any whole number such that $t \geq 0$

C. any real number such that $0 \leq P(t) \leq 1{,}000$

D. any whole number such that $0 < P(t) \leq 1{,}000$

8. **The graph shows the height, y, in meters, of a rocket above sea level in terms of the time, t, in seconds, since it was launched. The rocket landed at sea level.**



What does the x-intercept represent in this situation?

A. the height from which the rocket was launched

B. the time it took the rocket to return to the ground

C. the total distance the rocket flew while it was in flight

D. the time it took the rocket to reach the highest point in its flight

9. Larry creates Function 1 is two linear functions of x. Function 1 is represented by the table below.

Function 1

x	1	4	7	9	10
y	4	10	16	20	22

Function 2 is described by the equation below.

Function 2: $y = 3x - 1$

Which statement about the functions is true?

A. The y-intercept of function 1 is greater than the y-intercept of function 2.

B. The value of function 1 is less than the value of function 2 for every value of x.

C. The rate of change of function 1 is greater than the rate of change of function 2.

D. The rate of change of function 1 varies, while the rate of change of function 2 remains constant.

10. Limousine Company P and Company R both charge a rental fee plus an additional charge per hour.

- The equation $y = 50 + 30x$ models the total cost (in dollars), y, of renting a limousine from Company P for x hours.
- The table below shows the cost to rent a limousine from Company R for different lengths of time.

Company R

Time (hours)	1	2	3	4	5
Total Cost	\$100	\$125	\$150	\$175	\$200

Which statement accurately compares the per hour charges of the two companies?

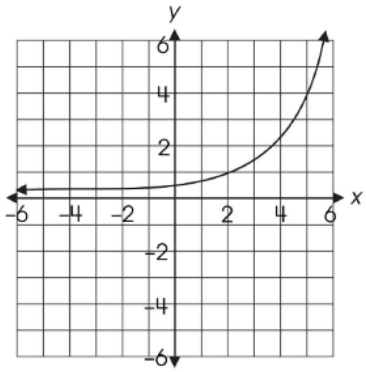
A. Company P charges \$5 less per hour than Company R.

B. Company P charges \$5 more per hour than Company R.

C. Company P charges \$25 less per hour than Company R.

D. Company P charges \$25 more per hour than Company R.

11. A relationship is shown.



As the value of y decreases, what happens to the value of x?

A. The value of x decreases.

B. The value of x increases.

C. The value of x stays the same.

D. The value of x increases and decreases.

12.

Use the two functions below to answer the question.

Function A

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

Function B

x	y
2	−8
4	−9
6	−10
8	−11

Which statement about the slopes of the functions is true?

A. The slopes of both functions are negative.

B. The slopes of both functions are positive.

C. The slope of function A is negative and the slope of function B is positive.

D. The slope of function A is positive and the slope of function B is negative.

13. Jerry goes to a theme park to ride the roller coasters. The theme park charges an entry fee in addition to a fee for each roller coaster ride. The table below represents the total price for two different numbers of roller coaster rides

Theme Park

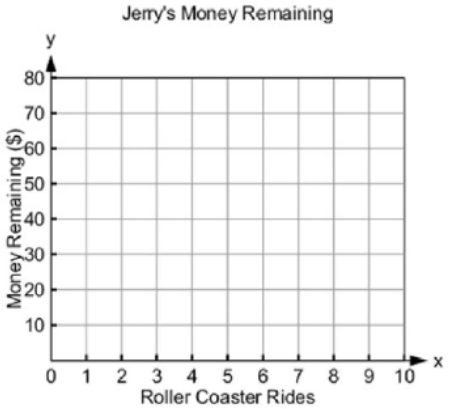
Number of Roller Coaster Rides	Total Price
5	$35
11	$59

a) What are the prices, in dollars, for the entry fee and for each roller coaster ride?

entry fee: $

one roller coaster ride: $

b) Jerry has $70 when he goes to the theme park. He only spends the money on the entry fee and roller coaster rides. On the grid shown below, draw a graph showing the amount of money Jerry has remaining after he enters the theme park and as he rides the roller coasters in the theme park.



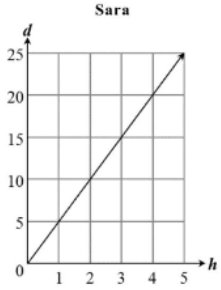
c) Explain how the y-intercept and the slope of the function in **part a)** differs from the y-intercept and the slope of the function in **part b)**. Be sure to indicate what each represents in your explanation.

14. The table shows the relationship between the number of hours, h, John has been hiking and the total distance, d, he has traveled in kilometers.

John

h	0	1	2	3	4	5
d	0	4	8	12	16	20

The graph shows the distance Sara hiked over the same time period.



Who hikes faster?

A. Sara

B. John

C. They hike at the same rate

D. There is not enough information to determine