

## Exponential Functions Test

### Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. Look at the table shown below.

$x$	$y$
0	4
1	6
2	9
3	13.5

Which of the following statements is NOT true about the table?

- A. The function is exponential.
  - B. The function relating the variables is  $y = 4(1.5)^x$ .
  - C. The common ratio is 4.
  - D. The function is increasing.
2. The table below represents an exponential function.

$x$	$y$
0	6
1	3
2	1.5
3	0.75

Which of the following is the function relating the variables?

- A.  $y = 6(2)^x$
- B.  $y = 6\left(\frac{1}{2}\right)^x$
- C.  $y = 2(6)^x$
- D.  $y = \frac{1}{2}(6)^x$

3. Look at the function rule shown below.

$$y = 5(1.2)^x$$

Which of the following tables contains values of the function?

A.

$x$	$y$
0	1.2
1	6
2	30
3	150

B.

$x$	$y$
2	5
3	6
4	7.2
5	8.64

C.

$x$	$y$
0	1
1	6
2	36
3	216

D.

$x$	$y$
1	6
2	7.2
3	8.64
4	10.368

4. When Carlton purchased a new truck, he knew its value would depreciate over time. The table below shows the car's value for the first five years after it was purchased.

Years since purchase, $x$	Value of car, $f(x)$
0	\$39,900
1	\$35,500
2	\$30,900
3	\$27,000
4	\$23,999
5	\$21,000

Use the given data set to predict when the car's value will drop below \$10,000.

- A. 8 years  
 B. 7 years  
 C. 11 years  
 D. 10 years

5. Which of the following functions best models the given data?

$x$	0	1	2	3	4	5	6
$y$	120	91	68	50.7	37.8	28.5	21.3

- A.  $y = 120(0.25)^x$   
 B.  $y = 120 - 29x$   
 C.  $y = 120(0.75)^x$   
 D.  $y = 120 - 16.5x$

6. The population of a small town started to decrease when the job market changed. The table below shows the town's population since 1985.

5-year interval, $x$	Year	Town's population, $f(x)$
0	1980	2000
1	1985	1700
2	1990	1500
3	1995	1250
4	2000	1000
5	2005	900

The exponential function  $f(x) = 2000(0.85)^x$  can be used to model this situation. Which of the following statements does not accurately describe this situation and its function model?

- A. The function that models the situation is an exponential decay function.  
 B. The population of the town will be less than 400 by the year 2020.  
 C. The town is decreasing in size by about 15% every five years.  
 D. The population in the year 2000 was half the 1980 population.
7. Keiana's grandparents opened a savings account for her when she was born. She rarely deposits or withdraws money from this account, but does earn interest. Her savings over time is shown in the table.

5-year interval, $x$	Years since starting the account	Amount in savings, $f(x)$
0	0	\$10,000
1	5	\$10,350
2	10	\$10,500
3	15	\$11,000
4	20	\$11,250
5	25	\$11,600

Use an exponential model based on the given data set to predict how much will she have in savings when she turns 40.

- A. \$12,668  
 B. \$11,941  
 C. \$32,620  
 D. \$24,273

8. Look at the table shown below.

$x$	$y$
1	12
2	36
3	108
4	324

Which of the following represents the common ratio in the table?

- A. 9
  - B.  $\frac{1}{3}$
  - C. 1
  - D. 3
9. The table below represents an exponential function.

$x$	$y$
2	32
3	128
4	512
5	2048

Which of the following is the function relating the variables?

- A.  $y = 4(x)^2$
- B.  $y = 2(4)^x$
- C.  $y = 4(2)^x$
- D.  $y = 8(4)^x$

10. After receiving large amounts of rain, the mosquito population of a certain area in Texas was growing quickly. The table below shows the increase in the number of mosquitos in the area since they started calculating their population.

# of Days, $x$	# of mosquitos, $f(x)$
0	250
1	295
2	350
3	410
4	485
5	572

Which of the following functions best models the situation above?

- A.  $f(x) = 250(5.90)^x$   
 B.  $f(x) = 250 + 64.4x$   
 C.  $f(x) = 250(1.18)^x$   
 D.  $f(x) = 250 + 45x$

### Short Answer

11. Use the exponential model to determine the approximate temperature after  $\frac{1}{2}$  hour.

Use the following table for problems 14 and 15.

Number of 3-min intervals, $x$	Number of Minutes	Temperature (F°), $f(x)$
0	0	180.2
1	3	172.5
2	6	163.8
3	9	155.6
4	12	147.9
5	15	140.8

13. Complete the table below to represent the situation.

Number of Folds $x$	Total Thickness of Layers $y$
0	0.1
1	0.2
2	
3	
4	

12. Write an exponential model for this data.

State whether the table represents an exponential function or not. If the table represents an exponential function, write the common ratio and the equation for the function.

14.

$x$	$y$
0	240
1	180
2	135
3	101.25

15.

$x$	$y$
0	750
1	900
2	1080
3	1296

16. Determine whether a linear model or an exponential model would be most appropriate for the data. Explain how you made your decision.

$x$	$y$
0	209.5
1	184.6
2	159.6
3	134.4
4	109.6
5	84.5

17.

Identify if the table represents an exponential function or not. If the table represents an exponential function, identify the common ratio.

$x$	$y$
1	2
2	4
3	8
4	16

18. Use finite differences to determine if the table represents an exponential function.

$x$	$y$
0	2
1	6
2	18
3	54

19. Calculate the average ratio between successive  $y$ -values.

$x$	$y$
0	425.6
1	766.08
2	1225.73
3	2083.74
4	3750.73

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

ID: A

20.

$x$	$y$
0	12
1	24
2	36
3	64