

1. Which sequence below represents an exponential sequence?

- a. 6, 12, 18, 24, ...  
 b. 6, 11, 17, ...  
 c. 2, 14, 98, 686, ...

2. Which equation represents a geometric sequence?

- a.  $y = 2x - 3$   
 b.  $y = x^2 + 4x + 3$   
 c.  $y = 3^x + 3$

3. Which equation below will produce a decay curve?

- a.  $y = 2(1.03)^x$   
 b.  $y = 3^x + 2$   
 c.  $y = \frac{1}{3}(2)^x$   
 d.  $y = 2(1/3)^x$

4. Rachel invested \$4000 into an account that has a 3.5% annual interest rate. Write an equation best describes this investment after  $t$  years?

$$y = 4000(1 + 0.035)^t$$

5. A photocopier is purchased for \$7200 and it depreciates in value by 15% per year. Write an equation that best describes the value of the photocopier in  $t$  years?

$$y = 7200(1 - 0.15)^t$$

6. Write an equation for the relationship below?

x	0	1	2	3
y	2/9	2	18	162

$$y = \frac{2}{9}(9)^{n-1}$$

7. For the equation  $y = 3.5^x - 6$ ,

a) What is the equation for the horizontal asymptote?

$$y = -6$$

b) What is the y-intercept?

$$(0, -5)$$

8. A coffee is sitting on Mr. Hunt's desk cooling. It cools according to the function  $T = 75(0.98)^x + 20$  where  $x$  is the time in minutes and  $T$  is the temperature in degrees.

A) What is the initial temperature of the coffee?

$$95^\circ$$

B) What is the temperature after 10 minutes?

$$81^\circ$$

Question 9 and 10 are sequences. Determine the missing terms by finding the common ratio or difference. Write the explicit formula, recursive formula, and calculate the  $n^{\text{th}}$  term for each.

9)  $\{7, -21, 63, \underline{-189}, \underline{567}, \underline{-1701}, \dots\}$

Common Ratio:  $-3$

Recursive Function:  $(a_{n-1})(-3)$

Explicit Formula:  $7(-3)^{n-1}$

Find the 12<sup>th</sup> Term:  $-1,240,029$

10)  $\{36, 31, 26, \underline{21}, \underline{16}, \underline{11}, \dots\}$

Common Difference:  $-5$

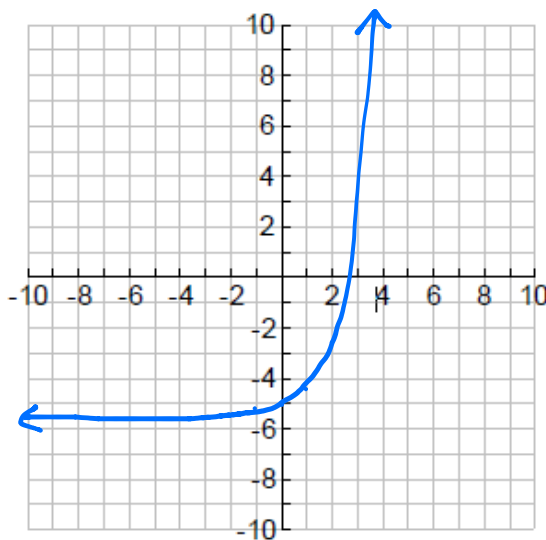
Recursive Formula:  $a_{n-1} - 5$

Explicit Formula:  $36 - 5(n-1)$

Find the 12<sup>th</sup> Term:  $-19$

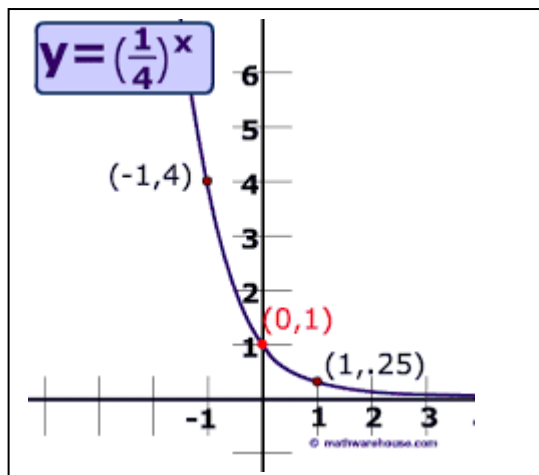
11. Complete the table of values and graph the following equation:  $y = 1.5^x - 6$

x	Y
-2	$-5.6$
-1	$-5.3$
0	$-5$
1	$-4.5$
2	$-3.75$
3	$-2.625$



12.  $y = (1/4)^x$

x	Y
-2	16
-1	4
0	1
1	1/4
2	1/16
3	1/64



- A) Identify the exponential function as growth or decay: decay
- B) Identify the common ratio:  $\frac{1}{4}$
- C) Identify the y-intercept: 1
- D) State the equation of the asymptote:  $y = 0$
- E) State the domain:  $(-\infty, \infty)$
- F) State the range:  $(0, \infty)$
- G)  $f(-3) =$  64

13. Use the two given functions to choose the best statement comparing the graphs to each other.

Function 1:  $y = 2^x$

Function 2:  $y = -2^x - 4$

- A) Function 2's graph is reflected then shifted down 4 from Function 1's graph.
- B. Function 2's graph is reflected then shifted up 4 from Function 1's graph.
- C. Function 2's graph is reflected then shifted left 4 from Function 1's graph.
- D. Function 2's graph is reflected then shifted right 4 from Function 1's graph

14. Explain what happened if function 1 was  $f(x) = -3x + 2$  was transformed to  $f(x) = -3x - 4$ .

Shift down 6

15. Tommy bought a new sports car for \$50 000. It depreciates annually by 20% per year.

A) Fill in the table below:

Year	0	1	2	3	4
Value of Car \$	50000	40,000	32,000	25,600	20,480

B) What is the common ratio?

0.8

C) What is the exponential function that describes the above data?

$$f(x) = 50000(.8)^x$$

D) Using your equation in c, find how much will the car be worth in 6 years (show workings).

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E) Use your calculator to find when it will be worth \$10,486?

7 years

16. Constructed Response:

Tara earns \$42,000 during the first year at her job. Each year after the first year, she will receive a raise of 7%.

A) Write the equation of a function  $S$  that gives Tara's salary as a function of the number of years,  $x$ , after she started her job.

$$y = 42,000(1.07)^t$$

B) Use the function from Part A to determine Tara's salary after 4 years. Show your work or explain your answer.

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