

Show all work and answer all parts of all questions.

Given information:	Type of sequence?	Common difference or ratio =	Increasing or decreasing?	Recursive equation:	Explicit equation:	The seventh term:										
1) 5, 7, 9, 11, ...																
2) $9, 3, 1, \frac{1}{3}, \frac{1}{9}, \dots$																
3) 1.50, 2.25, 3, 3.75, ...																
4) $\frac{2}{5}, 2, 10, 50, \dots$																
5) <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>16</td><td>10</td><td>4</td><td>-2</td><td>-8</td></tr> </table>	0	1	2	3	4	16	10	4	-2	-8						
0	1	2	3	4												
16	10	4	-2	-8												
6) <table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><td>80</td><td>20</td><td>5</td><td><math>\frac{5}{4}</math></td><td><math>\frac{5}{16}</math></td></tr> </table>	1	2	3	4	5	80	20	5	$\frac{5}{4}$	$\frac{5}{16}$						
1	2	3	4	5												
80	20	5	$\frac{5}{4}$	$\frac{5}{16}$												

Given information:	Type of equation?	Initial term?	Type of sequence?	Common difference or ratio =	Other type of equation
7) $f(n) = 3 + 7n$					
8) $f(0) = 6$ $f(n) = 2f(n - 1)$					
9) $f(1) = 20$ $f(n) = \frac{2}{5}f(n - 1)$					
10) $f(n) = 300 \left(\frac{1}{3}\right)^{(n-1)}$					
11) $f(n) = \frac{1}{2} \cdot 3^n$					
12) $f(0) = 15$ $f(n) = f(n - 1) - 5$					

Show all work and answer all parts of all questions.

$n$	1	2	3	4	5	6	7	8	9	10	11
$f(n)$	27	24	21	18	15	12	9	6	3	0	-3

Use the table above to answer #13-16

13) If  $f(n) = 15$ , what is the value of  $n$ ? \_\_\_\_\_ then find  $f(n + 4)$  \_\_\_\_\_ and  $f(n - 2)$  \_\_\_\_\_

14) If  $f(n) = 24$ , what is the value of  $n$ ? \_\_\_\_\_ then find  $f(n + 6)$  \_\_\_\_\_ and  $f(n + 8)$  \_\_\_\_\_

15) If  $f(n) = 3$ , what is the value of  $n$ ? \_\_\_\_\_ then find  $f(n - 7)$  \_\_\_\_\_ and  $f(n + 1)$  \_\_\_\_\_

16) If  $f(n) = 18$ , what is the value of  $n$ ? \_\_\_\_\_ then find  $f(n - 1)$  \_\_\_\_\_ and  $f(n + 3)$  \_\_\_\_\_

Find the missing terms of each **arithmetic** sequence17) 

$n$	1	2	3	4	5	6	7
$f(n)$	4						46

18) 

$n$	3	4	5	6	7
$f(n)$	50				22

19) 

$n$	0	1	2	3	4	5	6	7
$f(n)$	96							75

20) 

$n$	4	5	6	7	8
$f(n)$	17				77

Find the missing terms of each **geometric** sequence17) 

$n$	1	2	3	4	5
$f(n)$	2				512

18) 

$n$	2	3	4	5
$f(n)$	13			351

19) 

$n$	0	1	2	3	4	5	6
$f(n)$	384						6

20) 

$n$	7	8	9	10	11
$f(n)$	5625				9

For each situation, identify the two variables, make a table of values, a (fully labeled) graph, and write both recursive and explicit equations. Show all work on a **separate sheet of paper**.

21) Jai'Lin is saving money to buy a boat. He has \$400 and plans to save \$50 more every week until he has enough.

22) Liza is starting a new work out plan. She plans to do 5 sit-ups the first day, then add 2 more sit-ups every day.

23) Maria started a new job. She was promised a salary of \$35,000 for the first year and a 5% increase every year.

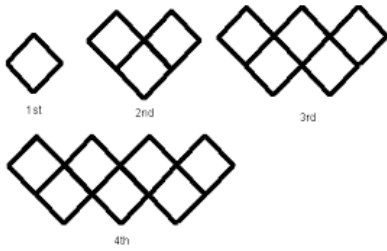
24) Julian is determined to eat healthier. He realizes that he currently consumes about 50 mg of sugar in a typical day. He plans to reduce that amount by 5 mg every day.

25) Haylie worked all summer and saved \$450. She plans to spend \$10 per week on after school snacks.

26) Aidan is interested in the stock market. He has been watching one particular company's value. It was originally valued at \$250 per share. It has lost \$12% of its value every week.

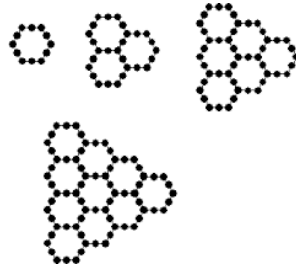
The first four figures of a picture pattern are shown. On a **separate sheet of paper**, a. Describe how each pattern is growing visually. b. Identify each sequence as arithmetic, geometric, or neither. c. If the sequence is arithmetic, identify the common difference; if the sequence is geometric, identify the common ratio. d. Write an explicit formula (if possible)

27)



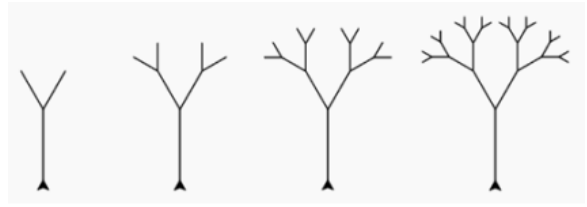
$n$  =figure number  
 $f(n)$  =number of diamonds

29)



$n$  =figure number  
 $f(n)$  =number of hexagons

30)



$n$  =figure number  
 $f(n)$  =number of branches

Choose the best answer.

31) A rabbit population starts with 10 rabbits and doubles each year for three years. How many rabbits will there be at the end of the three years?

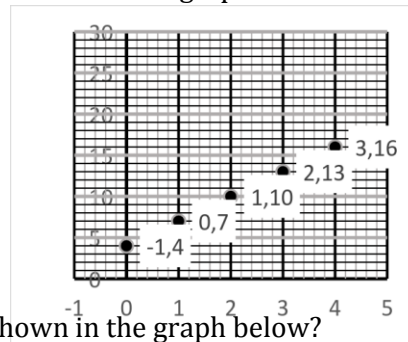
- A. 30      B. 80      C. 150      D. 630

32) A single bacterium lands in your mouth and starts growing by a factor of 4 every hour. After how many hours will the number of bacteria exceed 1,000?

- A. One hour      B. Three hours      C. Five hours      D. Twenty hours

33) What is the recursive function that fits with the sequence shown in the graph below?

- a.  $f(1) = 4, f(x) = f(x-1) \cdot 3$   
 b.  $f(1) = 4, f(x) = f(x-1) + 3$   
 c.  $f(0) = 4, f(x) = f(x-1) \cdot 3^x$   
 d.  $f(0) = 4, f(x) = f(x-1) + 3$



34) What is the explicit function that fits with the sequence shown in the graph below?

- a.  $f(x) = 3x + 4$   
 b.  $f(x) = 3^x(4)$   
 c.  $f(x) = 3x + 5$   
 d.  $f(x) = 3^x(5)$

