

Name Key
Algebra 1 CC

Date _____
Period _____

Homework

1) Determine if the sequence is arithmetic or geometric. If it is arithmetic, find the common difference and if it is geometric, find the common ratio.

a) -1, 6, -36, 216, ...

$$r = -6$$
 Geometric

b) 9, 14, 19, 24, ...

$$d = 5$$
 Arithmetic

2) Given the first term and the common difference, find the explicit formula and the next 2 terms.

$A_1 = 28, d = 10$
 $a_n = a_1 + d(n-1)$
 $a_n = 28 + 10(n-1)$
 $a_n = 28 + 10n - 10$

$$a_n = 10n + 18$$

$n=2$
 $a_n = 10n + 18$
 $a_2 = 10(2) + 18$
 $a_2 = 20 + 18$

$$a_2 = 38$$

$n=3$
 $a_n = 10n + 18$
 $a_3 = 10(3) + 18$
 $a_3 = 30 + 18$

$$a_3 = 48$$

3) Given the first term and the common ratio, find the explicit formula and the next 2 terms.

$A_1 = -4, r = 6$
 $a_n = a_1 \cdot r^{n-1}$

$$a_n = -4 \cdot 6^{n-1}$$

$n=2$
 $a_n = -4 \cdot 6^{n-1}$
 $a_2 = -4 \cdot 6^{(2-1)}$
 $a_2 = -4 \cdot 6^1$
 $a_2 = -4 \cdot 6$

$$a_2 = -24$$

$n=3$
 $a_n = -4 \cdot 6^{n-1}$
 $a_3 = -4 \cdot 6^{(3-1)}$
 $a_3 = -4 \cdot 6^2$
 $a_3 = -4 \cdot 36$

$$a_3 = -144$$

$a_0 = 500$ (careful!!)

4) A culture of bacteria doubles every hour. If there are 500 bacteria at the beginning, how many bacteria will there be after 6 hours?

$a_0 = 500$
 $a_1 = 1000$
 $r = 2$

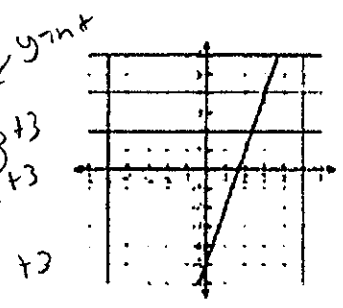
$a_n = a_1 \cdot r^{n-1}$
 $a_n = 1000 \cdot 2^{n-1}$

$n=6$
 $a_n = 1000 \cdot 2^{n-1}$
 $a_6 = 1000 \cdot 2^{(6-1)}$
 $a_6 = 1000 \cdot 2^5$
 $a_6 = 1000 \cdot 32$

$$a_6 = 32,000$$

5) Using the graph or the table, answer the following questions: Is the following function arithmetic or geometric? Find the common difference or ratio and the explicit formula.

x	y
0	-5
1	-2
2	1
3	4



linear is arithmetic

$$d = 3$$

 $a_1 = -2$

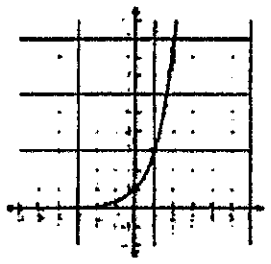
$a_n = a_1 + d(n-1)$
 $a_n = -2 + 3(n-1)$
 $a_n = -2 + 3n - 3$

$$a_n = 3n - 5$$

 $m=3 \quad b=-5$
 $d=3 \quad a_0=-5$

6) Using the graph or the table, answer the following questions: Is the following function arithmetic or geometric? Find the common difference or ratio and the explicit formula.

x	y
0	1
1	3
2	9



Exponential is always geometric

$r=3$
 $a_1=1$

$a_n = a_1 \cdot r^{n-1}$
 $a_n = 1 \cdot 3^{n-1}$
 $a_n = 3^{n-1}$
 $a_n = 3^n$

7) A museum usually has 4,000,000 visitors. They made some changes to increase visitors. The table shows the projected annual visitors to the museum (in millions) after the changes. What is the projected number of visitors in 7 years?

Year	Visitors (millions)
0	4
1	6
2	9
3	13.5
4	20.25

Geometric
 $a_1=4$
 $r=1.5$

$a_n = a_1 \cdot r^{n-1}$
 $a_n = 4 \cdot 1.5^{n-1}$

$n=7$
 $a_n = 4 \cdot 1.5^{n-1}$
 $a_7 = 4 \cdot 1.5^6$
 $a_7 = 4 \cdot 11.390625$
 $a_7 = 45.5625$

45,562,500

8) A theater has 20 seats in the first row, 22 in the second row, 24 in the third row, and so on for 35 rows.

$a_1=20$

Arithmetic

a) If the pattern continues, determine and state a formula that can be used to determine how many seats are in the nth row.

$a_1=20$

$d=2$

$a_n = a_1 + d(n-1)$
 $a_n = 20 + 2(n-1)$

$a_n = 20 + 2n - 2$

$a_n = 2n + 18$

b) Use your formula to determine how many seats are in the 13th row. $n=13$

$n=13$
 $a_n = 2n + 18$
 $a_{13} = 2(13) + 18$
 $a_{13} = 26 + 18$

$a_{13} = 44$

44 seats

9) You visit the Grand Canyon and drop a penny off the edge of a cliff. The distance the penny will fall is 16 feet the first second, 48 feet the next second, 80 feet the third second, and so on. What is the total distance the object will fall in 6 seconds?

Arithmetic
 $a_1=16$
 $d=32$

$a_n = a_1 + d(n-1)$
 $a_n = 16 + 32(n-1)$
 $a_n = 16 + 32n - 32$
 $a_n = 32n - 16$

$n=6$
 $a_n = 32n - 16$
 $a_6 = 32(6) - 16$
 $a_6 = 192 - 16$
 $a_6 = 176$

176 ft