4) Michael is sick with the flu but he still comes to school on Monday. He arrives at 8am and by 9am (Hour 1), Michael has already infected two of his friends, Joe and Lia. By 10am (Hour 2), Joe has infected two of his friends, Bill and Ted, and Lia has infected two of her friends, Jenny and Kiara.

(a) If each person with the flu infects two other people in each hour, how many students are infected by 3pm (Hour 7)? Complete the table and graph the points on the grid below.

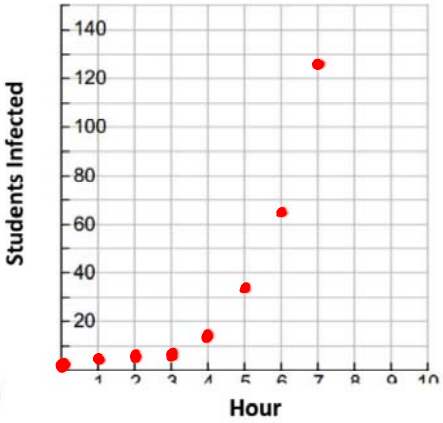
a_0 a_1

Hour	n	0	1	2	3	4	5	6	7
Number of students infected each hour	$f(n)$	1	2	4	8	16	32	64	128

(b) Does this situation represent an arithmetic or geometric sequence?

(c) Write an explicit formula to represent the sequence.

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



(d) Graph the sequence. Is it a picture of a line?

linear function

NO.

HOMEWORK QUESTION (Yes, it's just one question, hooray!)

An archery competition begins with 256 competitors. After the first round, one-fourth of the competing group remains. After the second round, one-fourth of the now smaller competing group remains. The last round is when there are fewer than five members in the competing group.

(a) Which round is the last round?

(b) How many competitors are in the last round?

Name: _____ Date: _____

Arithmetic or Geometric?

Do Now:

i) Identify each sequence as arithmetic or geometric.

ii) Determine the *common difference* or *common ratio* for each sequence.

$5-2$, 3, $8-5=3$

A. 2, 5, 8, 11, ... arithmetic $d=3$

$-48 \div 24$, -2

B. -12, 24, -48, 96, ... geometric $r=-2$

Is it Arithmetic or Geometric?

When determining if a sequence of numbers is arithmetic or geometric, determine whether or not the pattern displays a common difference or a common ratio between consecutive terms.

Determine if each sequence below is *arithmetic*, *geometric* or *neither*. If arithmetic, identify the common difference. If geometric, identify the common ratio.

$\frac{18}{12}=1.5$

1) 12, 18, 27, 40.5, ... geometric $r=1.5$

$\frac{27}{18}=1.5$

2) -123, -137, -151, -165 ... arithmetic $d=-14$

3) 3, 7, 15, 31, ... neither

$\frac{1}{64} \div \frac{1}{16} = \frac{1}{4}$

4) $1, \frac{1}{4}, \frac{1}{16}, \frac{1}{64}, \ldots$ geometric $r=\frac{1}{4}$

For each sequence below, determine if the sequence is arithmetic or geometric. Write an equation that can be used to find the nth term of the sequence. Find a_7.

5)

n	1	2	3	4
a_n	50,500	5050	505	50.5

$a_1 = 50{,}500$

$r = .1$ or $\frac{1}{10}$

$a_n = 50500 \cdot \left(\frac{1}{10}\right)^{n-1}$

$a_7 = 50500 \cdot \left(\frac{1}{10}\right)^{7-1}$

$a_7 = .0505$

6)

n	1	2	3	4
a_n	-16	-11	-6	-1

$a_1 = -16$

$d = 5$

$a_n = -16 + 5(n-1)$

$a_7 = -16 + 5(7-1)$

$a_7 = 14$

17, 34, 51

7) Katie works at the local pet shop. For a single litter of kittens, she puts out 17 ounces of wet food. For 2 litters she puts out 34 ounces of wet food and for 3 litters, she puts out 51 ounces of wet food. She continues this pattern for **n** litters.

a) Write an equation that can be used to find the number of ounces of wet food, a_n, Katie will put out for **n** litters of kittens.

$a_1 = 17$
$d = 17$
$a_n = 17 + 17(n-1)$

b) How much wet food will Katie put out if there are 8 litters of kittens in the store?

$a_8 = 17 + 17(8-1)$
$a_8 = 136$ ounces

8) A soup kitchen makes 16 gallons of soup every two weeks. Each day they serve 25% of the soup that remains from the previous day. The table below shows how much soup, **f(n)**, remains after **n** days.

n	1	2	3
f(n)	12	9	6.75

a) Write an equation that can be used to find the number of gallons of soup remaining after **n** days.

$a_n = 12 \cdot \left(\frac{3}{4}\right)^{n-1}$

b) How many gallons of soup remain after the 12th day? *Round your answer to the nearest tenth.*

$a_{12} = 12 \cdot \left(\frac{3}{4}\right)^{12-1}$
$a_{12} = .5$ gallons

c) On what day is there about 2 gallons of soup left?

9) Write an explicit rule for an arithmetic sequence if $a_6 = 8$ and $a_{10} = 40$. Using your rule, find the 20th term.

$\underset{a_4}{-8}, \underset{a_5}{0}, \underset{a_6}{8}, \underset{a_7}{16}, \underset{a_8}{24}, \underset{a_9}{32}, \underset{a_{10}}{40}$

$a_n = -32 + 8(n-1)$

10) Write an explicit rule for a geometric sequence if $a_3 = 10$ and $r = \frac{1}{2}$.

Conclusion!

If a sequence of numbers is **arithmetic**, the pattern will display a common _____ between consecutive terms. An explicit formula $\mathbf{a_n}$ =_____ can be used to find the ***n*th** term of the sequence.

If a sequence of numbers is **geometric**, the pattern will display a common _____ between consecutive terms. An explicit formula $\mathbf{a_n}$ =_____ can be used to find the ***n*th** term of the sequence.