Name: _____ Date: _____

UNIT 5 LESSON 5

Let's Think! What would come next?

Do Now: Find the pattern and fill in the missing numbers.

a) 4, 8, 16, 32, 64, 128 b) 4, 12, 36, 108, -162, 486

AIM: GEOMETRIC SEQUENCE

1. Identify a pattern in the sequence and then find the missing terms:	2. Identify a pattern in the sequence and then find the missing terms:
-2000, -1000, -500, -250, -125	6, –18, 54, -162, 486
Rule: divide by 2 to get the next term (* multiply by $\frac{1}{2}$ *)	Rule: multiply by -3 to get the next term.

In a geometric sequence, the amount by which the terms change each time is called the common ratio. The common ratio is represented by r.

$$\mathbf{r = a_2 \div a_1}$$

* In a geometric sequence, you are either multiplying or dividing to find the next term!

3. Consider a sequence that follows 1, 3 ,9…

a) What is the first term? $a_1 = 1$

b) What is the common ratio? $a_2 \div a_1 = 3 \div 1 = 3$

Term Number "n"	Term
a_1	1
a_2	3
a_3	9
a_4	27

4. Consider a sequence that follows 160, 80, 40 …

a) What is the first term? $a_1 = 160$

b) What is the common ratio? $r = \frac{a_2}{a_1} = \frac{80}{160} = \frac{1}{2}$

* common mistake r = 2

Term Number "n"	Term
a_1	160
a_2	80
a_3	40
a_4	20
a_5	10

5. Consider a sequence that follows 1, 5, 25, 125, 625,….

a) What is the first term? $a_1 = 1$

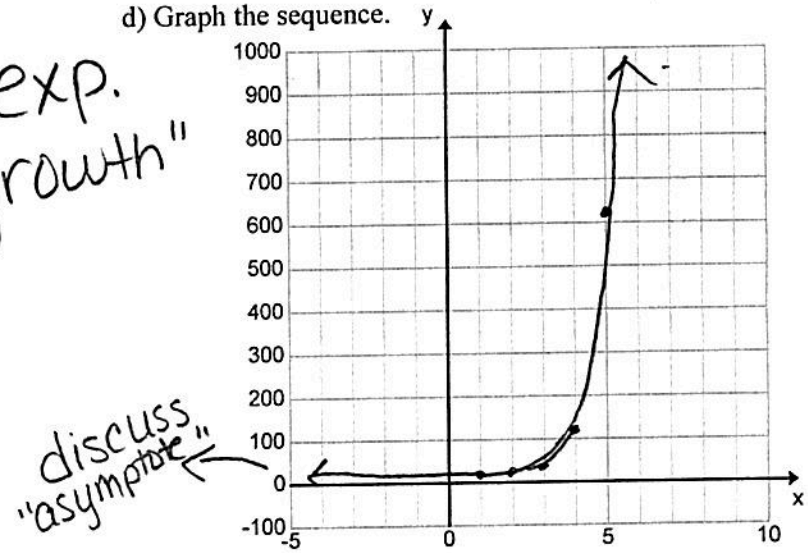
b) What is the common ratio? $r = \frac{5}{1} = 5$

c) Fill in table.

d) Graph the sequence.

exp. "growth"

Term Number "n"	Term
a_1	1
a_2	5
a_3	25
a_4	125
a_5	625



*** Geometric Sequences follow an** exponential **pattern!**

6. Consider a sequence that follows 81, 27, 9, …

a) What is the first term?

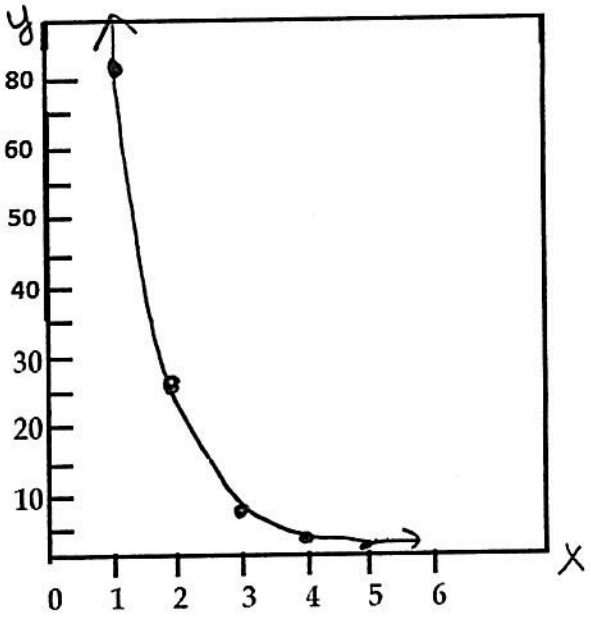
b) What is the common ratio?

c) Fill in table.

d) Graph the sequence.

exp "decay"

Term Number "n"	Term
a_1	81
a_2	27
a_3	9
a_4	3
a_5	1



What would the equation of these graphs be? ... **Hint: let's use our calculator!**

Rows 1, 2, and 3: Find the equation of #5_____

Rows 4, 5, and 6: Find the equation of #6_____

7. Determine whether each sequence is an arithmetic sequence, geometric sequence, or neither. If the sequence is arithmetic or geometric, state the common difference or common ratio.

Sequence	Arithmetic, Geometric, or Neither (Write A,G, or N)	Common difference or Common ratio
A. 1, -4, 16, -64, …	G	$r = \frac{-4}{1} = -4$
B. 108, 66, 141, 99, ….	N	
C. -96, -48, -24, -12, …	G	$r = \frac{-48}{-96} = \frac{1}{2}$
D. 7, 13, 19, 25, …	A	$d = 13 - 7 = 6$
E. 3, 9, 81, 6561, …	N	pattern? square term to get next term!

Name:_____ **EXIT TICKET**

1) Consider a sequence that follows 459, 153, 51, ...

a) What is the first term? $a_1 = 459$

b) What is the common ratio? $r = \frac{153}{459} = \frac{1}{3}$

c) Find the next term. 17

2) What type of graph does an **arithmetic** sequence have? linear

3) What type of graph does a **geometric** sequence have? exponential