Name:_____   Date:_____

Pre-Calculus 11: HW 1.3 Geometric Sequences

1.   Which of the following sequences is geometric. Indicate YES or NO: If YES, indicate the common ratio "*r*":

a) 2, 4, 6, 8, 10.....	b) 8, 12, 18, 27, 40.5.....
c) 0.25, 0.50, 1.0, 2.0, 4.0	d) $\dfrac{2}{3},\ \dfrac{-1}{3},\ \dfrac{1}{6},\ \dfrac{-1}{12},\ \dfrac{1}{24}$
e) $-4, -8, 16, 32, -64.....$	f) 3, 9, 27, 81, 243,...
g) $0.75,\ -0.75,\ 0.75,\ -0.75,\ 0.75$	h) $\dfrac{27}{32},\ \dfrac{9}{16},\ \dfrac{3}{8},\ \dfrac{1}{4},\ \dfrac{1}{6}$

2.   If the following is a geometric sequence, indicate the number of terms:

a) 6, 12, 24, ..., 3072	b) 24, 12, 6, ..., $\dfrac{3}{512}$
c) $\sqrt{3},\ -3,\ 3\sqrt{3},\ ....,\ 243\sqrt{3},$	d) $\dfrac{1}{8},\ -0.25,\ 0.5,\ ....,\ -1024$
e) $396,\ -132,\ 44,\ ....,\ \dfrac{44}{729}$	f) 2048, 512, 128, ..., $\dfrac{1}{2048}$

3. Given the information of a geometric sequence, find the indicated unknown value. Show your work algebraically:

a) $a = -3, \ r = 5, \ t_4 =$	b) $a = 16, \ r = -0.5, \ t_7 =$
c) $a = \dfrac{1}{6}, \ t_6 = 40.5, \ r =$	d) $a = 24, \ t_5 = \dfrac{1}{6}, \ r =$
e) $t_3 = 36, \ t_4 = 54, \ r = ?$	f) $t_5 = 18, t_4 = 9, a = ?$
g) $t_3 = 12, \ t_5 = 48, \ t_4 = ?$	h) $t_6 = 432, t_4 = 48, a = ?$

4. What is the main difference between an arithmetic sequence versus a geometric sequence?

5. Is the following a geometric sequence? Explain why or why not:

i) $4, -4, 4, -4, 4, -4, \ldots$

ii) $7, 7, 7, 7, 7, 7, 7 \ldots$

6. Suppose you had a generous friend that gave you money every day. On the first day he would give you a dollar and then each successive the amount increase by 20%. How much money will he give you on the 10th day?

7. Suppose the population of a colony of cockroaches double every three days. If they begin with 2, how many will there be in 30 days?

8. If you don't pay your Visa bill, the bank will charge you 20% interest each month. The interest is compounded, meaning that they will charge you interest on previous interest. If your bill is $100 and left unpaid, how much will you owe after 12 months?

9. The S&P 500, or the Standard & Poor's 500, is a stock market index based on the stock price of 500 large companies in the US. Many people use it as an indicator of the US stock market and it's economy. In January 1985, the price of the index fund was $179. In January 1995, the price of the index fund was $470. If the growth was modelled by a geometric sequence, determine the value of the index fund in 2005 and 2015.

10. What value of "x" in $x,\ 2x+2,\ 3x+3$ will form a geometric sequence?

11. Determine the value of "x" which makes $3, 3^x, 3^{x-5}$ a geometric sequence?

12. If $t_5 = 3x+2$ and $t_7 = 7x-22$ with a common ratio of $r = -3$, determine $t_6\ and\ t_8$.

13. Determine t_2 of a geometric sequence if $t_4 + t_5 = -3$ and $t_3 + t_4 = -6$