Name:_____ Date:_____

HW M12P Section 8.1 Geometric Sequences

1. What is a geometric sequence? How do you tell if a sequence is geometric or not? Explain:

2. What is the common ratio in a geometric sequence? How do you find the common ratio?

3. When finding the value of the n^{th} term in a geometric sequence, why is the exponent for the common ratio "n" MINUS one? Explain:

4. If you have the 3^{rd} term and 6^{th} term of a geometric sequence, how would you find the common ratio?

5. Suppose the first term of a geometric sequence is 19683, common ratio is 2/3 and last term is 101.1358025. How would you find the number of terms? Would you use logs?

6. From the previous question, suppose you found "n" and the value of negative or a decimal value. What does that indicate about your answer? Explain:

7. If you multiply the 5^{th} term of a geometric sequence with the common ratio 8 times, what term of the sequence will you get?

8. If the first term of a geometric sequence is 2 and the third term is 8, how many possible sequences are there? Explain:

9. IS the following sequence geometric. Indicate YES or NO: If YES, indicate the common ratio. If it is NOT a geometric sequence, explain why:

a) $2,\ 4,\ 6,\ 8,\ 10.....$	b) $0.25,\ 0.50,\ 1.0,\ 02.0,\ 04.0$
c) $\frac{2}{3},\ \frac{-1}{3},\ \frac{1}{6},\ \frac{-1}{12},\ \frac{1}{24}$	d) $\frac{27}{32},\ \frac{9}{16},\ \frac{3}{8},\ \frac{1}{4},\ \frac{1}{6}$
e) $0.75,\ -0.75,\ 0.75,\ -0.75,\ 0.75$	f) $a+b,\ a+b^2,\ a+b^3,\ a+b^4,\ a+b^5$
g) $\frac{a}{b},\ -\frac{a^2}{b^3},\ \frac{a^3}{b^6},\ -\frac{a^4}{b^9},\ \frac{a^5}{b^{12}}$	h) $\frac{c^2}{d},\ \frac{d}{c^2},\ \frac{c^2}{d},\ \frac{d}{c^2}$

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

a) $6,\ 12,\ 24,\ .....,\ 3072$	b) $24,\ 12,\ 6,\ .....,\ \frac{3}{512}$
c) $\sqrt{3},\ -3,\ 3\sqrt{3},\ .....,\ 243\sqrt{3},$	d) $\frac{1}{8},\ -0.25,\ 0.5,\ .....,\ -1024$
e) $396,\ -132,\ 44,\ .....,\ \frac{44}{729}$	f) $\frac{a^3}{b},\ a^2,\ ab,\ .....,\ \frac{b^{15}}{a^{13}}$
g) $2048,\ 512,\ 128,\ .....,\ \frac{1}{2048}$	h) $x-3,\ x,\ 3x+4,\ .....,\ (x+4)^6$

11. Given the information of a geometric sequence, find the indicated unknown value:

a) $a=-3,\ r=5,\ t_4=$	b) $t_2=5,\ t_7=50,\ r=?$
c) $t_4=\frac{4}{27},\ t_7=\frac{32}{729},\ r=?$	d) $t_3=12,\ t_4=k,\ t_5=48,\ k=$
e) $t_3=20,\ t_7=\frac{405}{4},\ t_6=?$	f) $t_1=a,\ t_2=7,\ t_3=b,\ \sqrt[3]{t_1\times t_2\times t_3}=?$

12. In a geometric sequence, $t_6=-160$ and $t_9=1280$, find the value of t_1.

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

14. In a geometric sequence, $t_5 = 160$ and $t_7 = 1440$, how many sequences are possible? Find the common ratio, value of the first term t_1.

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

16. Determine the first term and common ratio of a geometric sequence if $t_4 + t_5 = -3$ and $t_3 + t_4 = -6$

17. Given a geometric sequence where $t_1 + t_2 + t_3 = 333$ and $t_3 + t_4 + t_5 = 592$, find the first value and the common ratio:

18. A geometric sequence has two terms between 12 and 48. Find the two terms.

19. A geometric sequence has two terms between "x" and "y". Find the two values in between in terms of "x" and "y".

20. If "a" , "b" and "c" are in a geometric sequence, which are following are also a geometric sequence?

i) $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ *ii*) $c, -b, a$ *iii*) $3^a, 3^b, 3^c$

21. If the first two terms of a geometric sequence are $\sqrt{3},\ \sqrt[3]{3}$ what is the 3rd term?

22. If $t_1 = x+6,\ t_2 = 2x+17,$ and $t_3 = 5x+50$ are three consecutive terms in a geometric sequence, determine the value(s) of "x"

23. A ball is dropped from a height of 2.0m. After each bounce, it rises to 63% of its previous height. Write a general equation for the height after each bounce. What height does the ball reach after 5 bounces?