Name	
Dato	

Advanced Algebra

Unit 1: Sequence and Series

I can sum up a partial geometric sequence:

Assignment #8

Partial Sums of a geometric Series: $S_n = \frac{U_1(1-r^n)}{(1-r)}$

1) Find the sum of 2+6+18+54+... to 12 terms.

 $6(1-3^{12})$

Hint: #1 is geometric with U_1 =6, r=3, and n=12. Now use your formula

(1,594,320)

2) Find a formula as simplified as possible for the first n terms of $9+3+1+\frac{-1}{3}$ $-3(1-(-\frac{1}{3}))$ $-3(1-(-\frac{1}{3}))$

-9 (1-(1/3))

HINT: #2 is geometric with U_1 =-3 and $r=\frac{-1}{3}$ Substitute the information in and simplify as much as you can.

3) Find the sum of 24+12+6+3+....to 12 terms.

1 1 Vo V.

$$\frac{12(1-\frac{1}{2})}{(1-\frac{1}{2})} = (23.994)$$

:
$$S_n = \frac{U_1(1-r^n)}{(1-r)}$$

4)
$$12+6+3+1.5+...$$
 to 10 terms
$$V_0 = \frac{6(1-\frac{1}{2})}{(1-\frac{1}{2})} = \frac{11.988}{11.988}$$

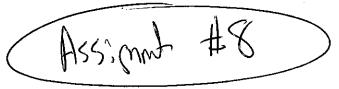
5) 20+10+5+2.5+... What is the limit of this series? Show and explain proof on your paper.

$$S_{10} = \frac{10(1-.5^{10})}{(1-.5)} = 19.98$$
 barely changing at all $S_{20} = \frac{10(1-.5^{20})}{(1-.5)} = 19.99$ limit is 20

- 6) Let S_n be the sum of an infinite geometric sequence such that $S_1=3$ and $S_2=4$
 - a) State the first term U₁

b) Calculate the common ratio r

c) Calculate U₅



Review: Remember simple geometric problems are always written $y=U_0*r^x$

If it is an increasing problem it is always (1+r) If it is a decreasing problem it is always (1-r)

7) You buy a car for \$42,000. The car depreciates 6% every year. Write a direct formula and state what the car will be worth in 10 years.

12,000 (1 -,06)

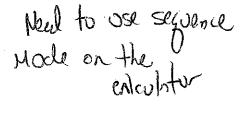
22, 621,83

8) You invest \$3,000 into an account that has 5%APR compounded monthly. You also deposit \$200 every month. How much money will be in the account in 8 years?

Answer \$ 28019.86

9) You take out a loan for \$45,000. The APR on the account is 4% compounded monthly. You make monthly payments of \$450. Write the shifted geometric sequence here:

a) How long will it take you to pay off the loan?



122 Hortho

b) How much is your last payment?

\$ 377.81

379.07 A yw Include interest

377.81 (1+光)= 379.07

How much in total did you pay?

Bd. 877.81

121 × 450 54,827.8 45,0W