Name_____

Date_____

Advanced Algebra

Unit 1: Sequence and Series

Assignment #4

I can find the common ratio of a geometric pattern that is not in order.

1) U_2= 18 and U_5 = 486

One strategy for this problem can be to make a table:

U_0	U_1	U_2	U_3	U_4	U_5
		18			486

r r r

I know that a common ration means that it is being multiplied over and over....so
18*r*r*r=486 This creates r^3 So I have
$18r^3 = 486$ Now I have an equation to solve. I know that I should divide by 18 and my last step will be to take the 3rd root. I can find roots on my calculator by pressing the MATH button.
$r^3=27$
$r=\sqrt[3]{27}$
r=3 My ratio is 3. I can then go back in the table by dividing to get back to U_0
In this case U_1= 18/3=6 and U_0=6/3= 2
U_0=2 and r=3

My recursive formula is $\begin{cases} U_0 = 2 \\ U_n = 3 * U_{(n-1)} \\ n \geq 1 \end{cases}$ The direct formula is $y=2*(3)^x$

For the following problems, set up a table to help you find the common ratio. Then write the recursive formula and the direct formula. (If you can find the common ratio without making the table, then that is OK. Just have the recursive and the direct formula.)

2) U_1 = 32 and U_3= 51200

U_0	U_1	U_2	U_3
.8	32		51,200

r r

$32r^2 = 51,200$

$r^2 = 1600$

$r = 40$

$\frac{32}{40}$

Direct

$y = .8(40)^x$

Recursive

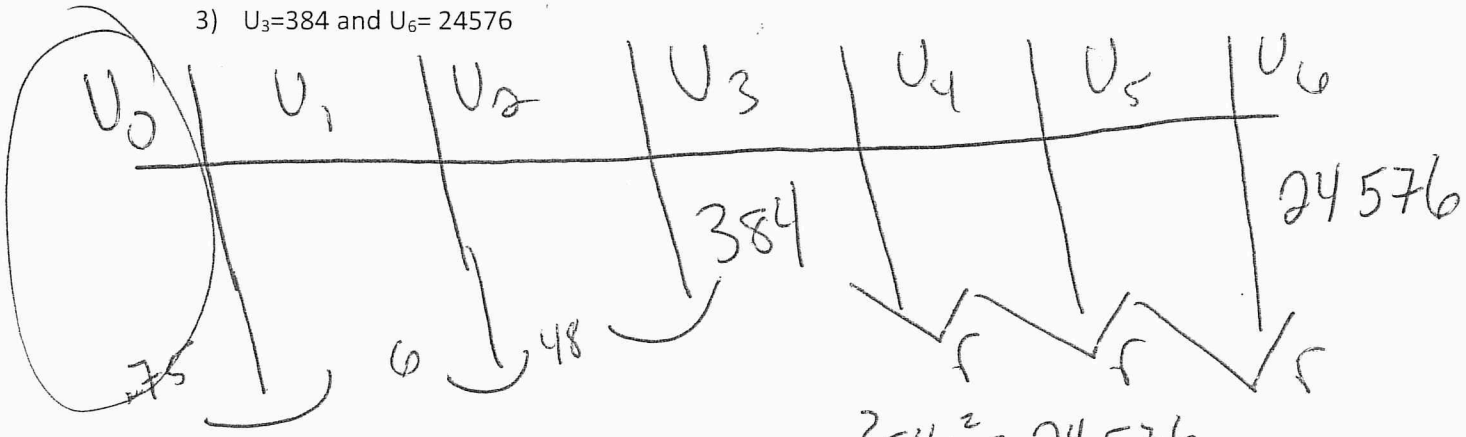
$U_0 = .8$

$U_n = 40 \cdot U_{(n-1)}$

$n \geq 1$

Assign #4

3) $U_3=384$ and $U_6=24576$



$384r^2 = 24576$

$r^2 = 64$ $\quad r=8$

Recursive Formula:

$U_0 = .75$

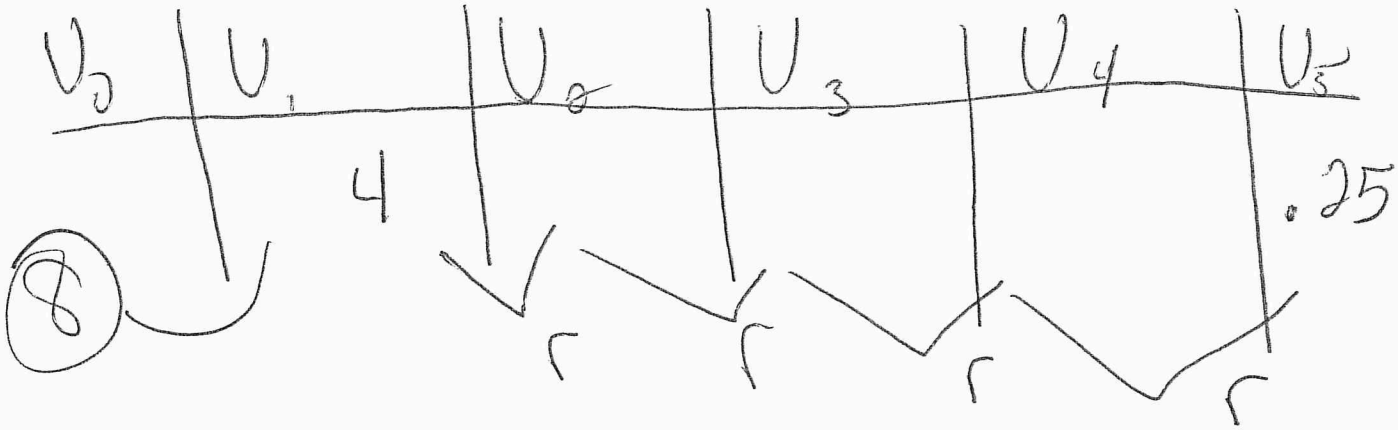
$U_n = 8 \cdot U_{(n-1)}$

$n \geq 1$

Direct Formula

$y = .75(.8)^x$

4) $U_1=4$ and $U_5=.25$



$4r^4 = .25$

$r^4 = .0625$

$r = .5$

Recursive Formula

$U_0 = 8$

$U_n = .5 \cdot U_{(n-1)}$

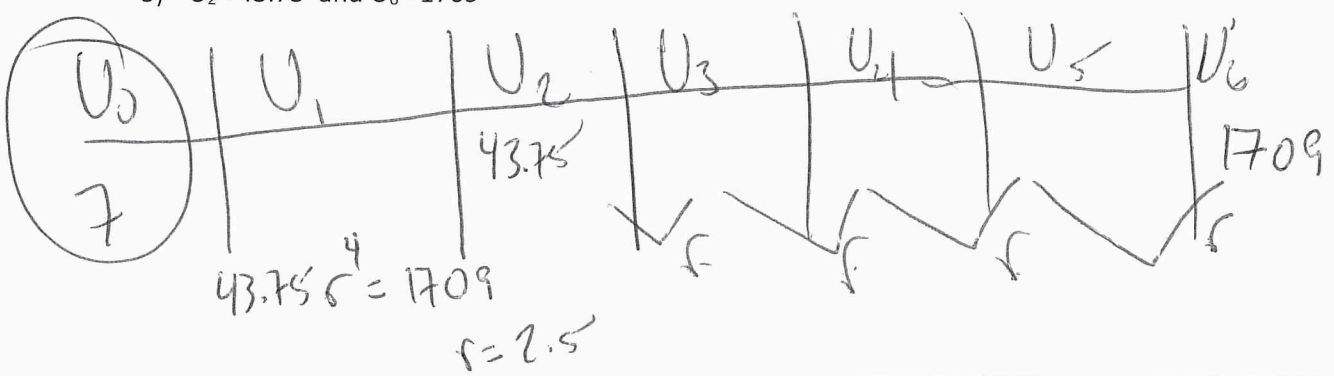
$n \geq 1$

Direct Formula

$y = 8\left(\frac{1}{2}\right)^x$

Assignment #4

5) $U_2 = 43.75$ and $U_6 = 1709$



$43.75r^4 = 1709$

$r = 2.5$

Recursive Formula

$U_0 = 7$

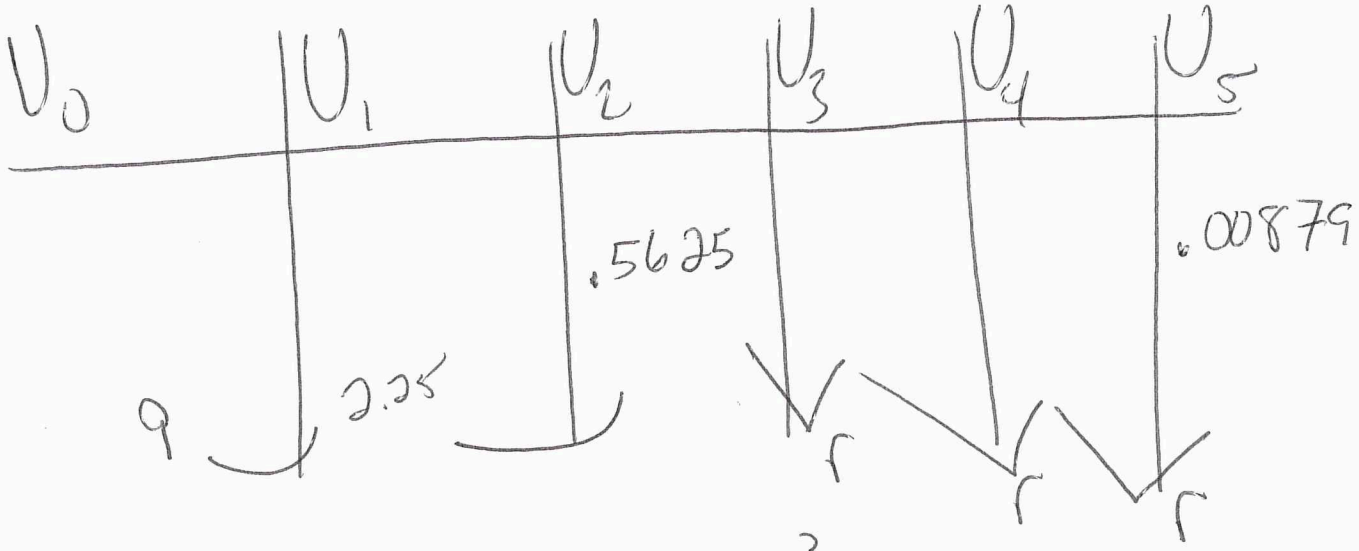
$U_n = 2.5 \cdot U_{(n-1)}$

$n \geq 1$

Direct Formula

$y = 7 \cdot 2.5^x$

6) $U_2 = .5625$ and $U_5 = .00879$



$.5625r^3 = .00879$

$r = .25$

Recursive Formula

$U_0 = 9$

$U_n = .25 \cdot U_{(n-1)}$

$n \geq 1$

Direct Formula

$y = 9(.25)^x$