

Name _____

Date _____

Advanced Algebra

Unit 1: Sequence and Series

Assignment #3a

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

The diagram shows three blue arrows pointing downwards from the values in the table to the label 'r'. The first arrow points from the value 18 in the U_2 column to the label 'r' below it. The second arrow points from the empty U_3 column to the label 'r' below it. The third arrow points from the empty U_4 column to the label 'r' below it. This indicates that the common ratio 'r' is applied between consecutive terms.

I know that a common ratio 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

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

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

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

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