

MA 2733

Worksheet 3 – September 8-9, 2015

Name _____

1. Unrolling recursions

(a) Give an explicit formula for the sequence recursively defined by $a_n = \sqrt{3} \cdot a_{n-1}$ for $n \geq 1$, with initial condition $a_0 = 9$.

(b) Give an explicit formula for the sequence recursively defined by $a_n = \frac{3}{2} \cdot a_{n-1}$ for $n \geq 3$, with initial condition $a_2 = 2$.

(c) Give an explicit formula for the sequence recursively defined by $a_n = 2n \cdot a_{n-1}$ for $n \geq 1$, with the initial condition $a_0 = 1$.

2. Reindex the sequence $a_n = \frac{(n-1)^2}{(n+1)^2}, n \geq 1$ to a sequence with first term a_0 .
(That is, “start at a_0 ” rather than “starting at a_1 ”.)

3. (a) Using sigma notation, write a series summing the even terms of $\sum_{n=1}^{\infty} \frac{1}{n}$. I.e., find

a series $\sum_{n=1}^{\infty} a_n = \frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \dots$

- (b) Using sigma notation, write a series summing the odd terms of $\sum_{n=1}^{\infty} \frac{1}{n}$. I.e., find a

series $\sum_{n=1}^{\infty} b_n = 1 + \frac{1}{3} + \frac{1}{5} + \dots$