Midterm 1

Math 253

February 9, 2024 Name:

Each part is worth 5 points, for a total of 60 points.

You may use a hand-written sheet of notes.

Show your work where appropriate.

No calculators or cheating.

1. Find a formula for the general term in the following sequences.  
   Indicate whether you’re starting from or ; either choice is ok.



1. Suppose that , and for we have .   
   1. Write out the first five terms of the sequence.
   2. Find an explicit formula for .
2. Evaluate the following limits:

   2. .
3. Consider the series .
   1. Write it in sigma notation, that is, as or .
   2. Find the first three partial sums .

1. Geometric series:  
   1. Fill in the blank: if , then

= .

* 1. Does the geometric series converge or diverge?  
     If it converges, find the limit.

1. Use the integral test to decide whether the following series converge or diverge.