Instructions

- ☐ You have 60 minutes for this quiz. Write your start and end time on the quiz.
- ☐ The quiz must be taken in one continuous period of time.
- ☐ You may use 1 page of notes (front and back) as a resource for this quiz.
- ☐ Please scan and submit your notes with your completed quiz.
- ☐ No other resources are allowed. No people, books, internet, software, etc.
- ☐ Please do not discuss the quiz with anyone before *everyone* has submitted it.
- ☐ Please do not share copies of your quiz solutions for *any reason*.

This quiz contains three questions closely related to the following topics:

- ☐ Reasoning about convergence of a sequence using the definition of convergence.
- ☐ Finding the limit of a sequence.
- ☐ Properties of convergent series (i.e. sum, difference, multiple) as on p. 746.
- ☐ Determining if a series converges using knowledge of geometric series.
- ☐ Determining if a series diverges using the divergence test.

Name:

Date:

Start time:

End time:

1. Does the following sequence converge or diverge?

$$\{1, 0, \frac{1}{2}, 0, 0, \frac{1}{3}, 0, 0, 0, \frac{1}{4}, 0, 0, 0, 0, \frac{1}{5}, \ldots\}$$

   Explain as precisely as you can.

2. Does the sequence $a_n = \dfrac{\ln n}{\sqrt{n}}$, $n = 1, 2, 3, \ldots$ converge or diverge? If it converges, find $\lim\limits_{n\to\infty} a_n$.

3. Does the following series converge or diverge? If it converges, find its sum.

$$\sum_{n=1}^{\infty} \frac{1}{1+n^{-2}}$$

4. Does the following series converge or diverge? If it converges, find its sum.

$$\sum_{n=1}^{\infty} \left(\frac{2}{3^n} - (-0.5)^n \right)$$