Homework for Week 1
March 31-April 4, 2008

The textbook exercises listed here should be completed before class begins; students will share solutions to these exercises at the beginning of class. You should be prepared to share a solution to any one of these.

Before Class on **Tuesday, April 1**, review Section 3.8 and work the following exercises:
Section 3.8, # 9, 11

Before Class on **Wednesday, April 2**, work the following exercises:
Page 254, # 1, 3

Before Class on **Thursday, April 3**, read Section 8.1 and work the following exercises:
Section 8.1, # 9, 13, 15, 17, 23

Before Class on **Friday, April 4**, read Section 8.2 (upto page 570) and work the following exercises:
Section 8.2, # 11, 13, 19, 33

**Additional Practice Problems**

Practice as many of these problems as you can. You may use your solutions as notes during the quiz on Tuesday, April 8.
Section 8.1, # 11, 19, 21, 25, 27, 41
Section 8.2, # 9, 15, 25, 31

> If in other sciences we should arrive at certainty without doubt and truth without error, it behooves us to place the foundation of knowledge in mathematics.

> - Roger Bacon

*More on back.*
Written Homework

Your carefully written solutions to these questions are due at the beginning of class on Friday, April 4.

1 Find the limits of each of the following sequences, or explain why the limit doesn’t exist. Also, if the sequence is increasing or decreasing, state which one. Justify your answers completely. (For part (e), that means you’ll also have to find a formula for the \( n^{th} \) term of the sequence.)

(a) \( a_n = \frac{4+n}{5+n} \)
(b) \( b_n = \frac{5^n}{n!} \)
(c) \( a_n = \tan^{-1}(n) \)
(d) \( c_n = \frac{(-1)^n}{n+2} \)
(e) \( \{1, \frac{2}{5}, \frac{4}{25}, \frac{4}{125}, \frac{5}{625}, \ldots\} \)

2 Determine whether each series converges or diverges. If it converges, find the sum.

(a) \( \sum_{n=0}^{\infty} \frac{2(3)^n}{4^n} \)
(b) \( \sum_{n=1}^{\infty} \left(\frac{3}{5}\right)^n \)
(c) \( \sum_{n=0}^{\infty} \frac{2^n}{7} \)

3 Determine for which values of \( x \) each of the following series converge. (You do not need to find the actual sums.)

(a) \( \sum_{n=1}^{\infty} \cos^n(x) \)
(b) \( \sum_{n=1}^{\infty} 2^{nx} \)