# Sequences Homework Part 2

**Note:** These problems, along with the assigned problems from Section 11.1, are due on Monday, March 31, 2008.

1. Determine whether the sequence $\{a_n\}$ defined by

$$a_n = \frac{\sin^2 n}{n^2 + 1}$$

converges or diverges. If the sequence converges, find the limit.

2. Determine whether the sequence $\{a_n\}$ defined by

$$a_n = \frac{n \cos n}{n^2 + 1}$$

converges or diverges. If the sequence converges, find the limit.

3. Determine whether the sequence $\{a_n\}$ defined by

$$a_n = \left(1 + \frac{3}{n}\right)^{4n}$$

converges or diverges. If the sequence converges, find the limit.