Serial No.:_____ Student Name:_____ Student Number: _____

Instructor: M. Z. Abu-Sbeih Math 102- Q3A Date: 20-12-2010

Problem 1: Determine whether the sequence is convergent or divergent. If it converges, find its limit.

(a) $\left\{\frac{2n}{n+1}\tan^{-1} n\right\}_{n=1}^{\infty}$

(b) $a_n = (-1)^n\left(\sqrt{n+2}-\sqrt{n}\right), \qquad n = 1, 2, 3, \cdots$

(c) $a_n = \frac{\sin n}{n^2+1}, \qquad n = 1, 2, 3, \cdots$

Problem 2: Determine whether the series is convergent or divergent. If it converges, find its sum.

(a) $\sum_{n=1}^{\infty} \frac{3^n + 2^{2n}}{4^n}$

(b) $\sum_{n=1}^{\infty} \frac{1}{4n^2 + 4n}$

(c) $\sum_{n=1}^{\infty} \left(1 + \frac{1}{n}\right)^n$