NAME:

APPM 1360.300—Quiz 3: Sequences and Series—07/02/09

Clearly print your name above. Show all work to receive full credit. Justify all answers!

1. (2 points each) Determine whether or not the *sequences* $\{a_n\}_{n=1}^{\infty}$ with a_n given below converge or diverge. Explain your reasoning, and show all steps.

(a) $a_n = (-2)^n$

(b) $a_n = \frac{n}{e^n}$

(c) $a_n = \ln(n-1) - ln(3n+2)$, for $n \geq 2$

(d) $a_n = 2\cos(n\pi)$

(e) a_n satisfies $0 < a_n < a_{n+1} < 1$ for all n

2. (5 points each) Determine whether or not the *series* given below converge or diverge. Find the value of the sum, if possible. Explain your reasoning, and show all steps.

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

(b) $\sum_{n=2}^{\infty} \frac{1}{n[\ln(n)]^2}$

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

(d) $\sum_{n=1}^{\infty} \frac{n!}{n^n}$