Books, notes, and calculators are allowed. *But you must show all your work.* You are on your honor to work alone. By including your name on this assignment, you are verifying that you have worked alone.

1. (8 pts) (Exam #2c) Determine whether the following series converges or diverges. [Show all your work and clearly indicate any tests that you use.]

$$\sum_{n=1}^{\infty} \frac{4 + \sin n}{n^2}$$

2. (12 pts) (Exam #6) [For this problem, use the <u>expanded</u> form of the series.]

(**a**). Use a known Maclaurin Series (in expanded form) to obtain the (expanded and simplified) Maclaurin Series for

$$f(x) = \frac{3x - 3\tan^{-1} x}{x^3}.$$ [You <u>must</u> simplify your answer before answering part (b).]

(**b**). Use the (simplified and expanded) series obtained in part (a) to evaluate the following integral.

$$\int \frac{3x - 3\tan^{-1} x}{x^3}\, dx$$ [Show at least 3 nonzero terms in your answer.]