HW2B. Written Homework 2B. **Due Week 2 Friday 11:59PM**

Name:

Instructions: Upload a pdf of your submission to **Gradescope**. This worksheet is worth 20 points: up to 8 points will be awarded for accuracy of certain parts (to be determined after the due date) and up to 12 points will be awarded for completion of parts not graded by accuracy.

(1) Use the **Integral Test** to determine the convergence of the following series. If the Integral Test is inapplicable, state at least one condition that it fails to satisfy.

Note that there may be other methods to determine the convergence of the following series. However, this worksheet tests your knowledge and understanding of the Integral Test.

(a) $\displaystyle\sum_{n=1}^{\infty} \sin\left(\pi n + \frac{\pi}{2}\right)$

(b) $\displaystyle\sum_{n=1}^{\infty} \left(\frac{2n-3}{n^2-3n+4}\right)$

(c) $\displaystyle\sum_{n=1}^{\infty} \left(\frac{n^2-3n+4}{2n-3}\right)$

(d) $\displaystyle\sum_{n=1}^{\infty} \left(\frac{\arctan n}{n^2+1}\right)$

(e) $\displaystyle\sum_{k=1}^{\infty} ke^{-3k^2}$

(f) $\displaystyle\sum_{n=2}^{\infty} \frac{\ln(n)}{n^2}$

(2) Find all p such that the series $\sum_{n=1}^{\infty} \frac{\ln(n)}{n^p}$ converges. Hint: The Integral Test can be used to identify p.

(3) Let $S = \sum_{n=1}^{\infty} 1n^3$. Find an area corrected approximation U_N of S accurate to within 0.001.

(Note: This problem will not be graded for accuracy)