

Name: \_\_\_\_\_  
Spring 2018

MAT 296: HW 9  
Due: 03/30

**Problem 1:** Use the Comparison Test or Limit Comparison Test to decide whether the following series converge or diverge. Be sure to justify your answer.

(i) 
$$\sum_{n=2}^{\infty} \frac{1}{n - \sqrt{n}}$$

(ii) 
$$\sum_{n=1}^{\infty} \frac{n^2 - 1}{3n^4 + 5}$$

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

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

$$(v) \sum_{n=1}^{\infty} \frac{1 + \cos n}{n^4}$$

$$(vi) \sum_{n=1}^{\infty} \frac{5}{3^n + 1}$$

$$(vii) \sum_{n=1}^{\infty} \frac{\ln n}{n+5}$$

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

$$(ix) \sum_{n=1}^{\infty} \sin^2\left(\frac{1}{n}\right)$$

$$(x) \sum_{n=1}^{\infty} \frac{6}{n + \sqrt{2n^2 + 5}}$$

$$(xi) \sum_{n=1}^{\infty} \frac{n^2 + \ln n}{n^4 + 5}$$

$$(xii) \sum_{n=1}^{\infty} \frac{2n - 5}{\sqrt{3n^6 - 2}}$$

$$(xiii) \sum_{n=1}^{\infty} \frac{7 + 4\sqrt[3]{n^4}}{n^2 + 2n + 1}$$