

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

MAT 296: HW 7  
Due: 03/26

**Problem 1:** For each of the following, determine if the Divergence Test applies. If the Divergence Test does not apply, explain why. If the Divergence Test does apply, use it to show that the series diverges.

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

(ii)  $\sum_{n=0}^{\infty} \frac{n+1}{n^2+3}$

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

$$(iv) \sum_{n=0}^{\infty} \frac{2n-3}{5n+1}$$

$$(v) \sum_{n=0}^{\infty} \cos\left(\frac{n-1}{n^2+3}\right)$$

$$(vi) \sum_{n=1}^{\infty} \left(1 + \frac{2}{5n}\right)^{3n}$$

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

$$(viii) \sum_{n=0}^{\infty} (-1)^n$$

$$(ix) \sum_{n=0}^{\infty} \arctan(n)$$