

LAST NAME:

FIRST NAME:

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**MATH 009C - Summer 2018**

Worksheet 6: July 31, 2018

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1. Use the Direct Comparison Test to determine whether the series converges or diverges.

(a)  $\sum_{n=1}^{\infty} \frac{3}{4^n + 1}$

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

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Please, show all work.

**2.** Use the Limit Comparison Test to determine whether the series converges or diverges.

$$(a) \quad \sum_{n=1}^{\infty} \frac{n^3 + 3n^2 + 7n + 1}{\sqrt{4n^{10} + 4n^6 + 9n^2 + 2}}$$

$$(b) \quad \sum_{n=1}^{\infty} \frac{5n}{n^2 + |\sin(n)|}$$

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

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**Please, show all work.**

**3.** Use the Ratio or Root test to determine if the series is convergent or divergent.

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

$$(b) \quad \sum_{n=1}^{\infty} (\arctan(n))^n$$

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Please, show all work.