

Name: _____

Instructor: _____

Math 10560, Quiz 8 Tutorial
April 4, 2017

- The Honor Code is in effect for this quiz. All work is to be your own.
- No calculators.
- The quiz lasts for 25 Minutes .
- Be sure that your name is on every page in case pages become detached.
- Be sure that you have all 5 pages of the test.

PLEASE MARK YOUR ANSWERS WITH AN X, not a circle!

1. (a) (b) (c) (d) (e)

2. (a) (b) (c) (d) (e)

3. (a) (b) (c) (d) (e)

4. (a) (b) (c) (d) (e)

5. (a) (b) (c) (d) (e)

Name: _____

Instructor: _____

Multiple Choice

1.(2 pts) Consider the following series

$$(I) \quad \sum_{n=3}^{\infty} \frac{\sin(n)}{n^3 + 1} \qquad (II) \quad \sum_{n=3}^{\infty} \frac{(-1)^n}{\sqrt{n^{3/2} - 1}}.$$

Which of the following statements is true?

- (a) (I) is absolutely convergent and (II) is conditionally convergent.
- (b) (I) and (II) are both conditionally convergent.
- (c) (I) and (II) both diverge.
- (d) (I) converges and (II) diverges.
- (e) (I) and (II) are both absolutely convergent.

2.(2 pts) Consider the following series.

$$(I) \quad \sum_{n=1}^{\infty} \frac{\sin(1/n)}{n^2} \qquad (II) \quad \sum_{n=1}^{\infty} \frac{n^4 - 1}{n^5 - n^3 + 1} \qquad (III) \quad \sum_{n=1}^{\infty} \frac{\cos(1/n)}{n}.$$

Which of the following is **true**?

- (a) (I) and (III) converge while (II) diverges.
- (b) All three series diverge.
- (c) All three series converge.
- (d) (III) converges while (I) and (II) diverge.
- (e) (I) converges while (II) and (III) diverge.

Name: _____

Instructor: _____

3.(2 pts) For what values of p is the following series convergent?

$$\sum_{n=2}^{\infty} \frac{(-1)^{n-1} \ln n}{n^p}.$$

- (a) $p > 0$ (b) $p < 0$ (c) for any p such that $p \neq 0$
(d) for all p (e) $p > 1$

4.(2 pts) Find the exact value of

$$\sum_{n=1}^{\infty} \frac{3^{2n-1}}{10^n}.$$

- (a) 3 (b) 1 (c) $\frac{10}{3}$ (d) 9 (e) $\frac{3}{2}$

Name: _____

Instructor: _____

5.(2 pts) Consider the following two series

$$(I) \quad \sum_{n=1}^{\infty} \frac{\sin(n)}{n\sqrt{n}+1} \qquad (II) \quad \sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{\sqrt{n^2+1}}.$$

Which of the following is **true**?

- (a) They are both absolutely convergent.
- (b) (I) is divergent while (II) is conditionally convergent.
- (c) They are both divergent.
- (d) (I) is absolutely convergent and (II) is conditionally convergent.
- (e) They are both conditionally convergent.

Name: _____

Instructor: _____

The following is the list of useful trigonometric formulas:

$$\sin^2 x + \cos^2 x = 1$$

$$1 + \tan^2 x = \sec^2 x$$

$$\sin^2 x = \frac{1}{2}(1 - \cos 2x)$$

$$\cos^2 x = \frac{1}{2}(1 + \cos 2x)$$

$$\sin 2x = 2 \sin x \cos x$$

$$\sin x \cos y = \frac{1}{2}(\sin(x - y) + \sin(x + y))$$

$$\sin x \sin y = \frac{1}{2}(\cos(x - y) - \cos(x + y))$$

$$\cos x \cos y = \frac{1}{2}(\cos(x - y) + \cos(x + y))$$

$$\int \sec \theta = \ln |\sec \theta + \tan \theta| + C$$