

MA 2733

Worksheet 3 / Review – September 20, 2016

Name \_\_\_\_\_

1. Discuss convergence of  $\sum_{n=0}^{\infty} (\sqrt{n} - \sqrt{n+1})$ .

2. Discuss convergence of  $\sum_{n=0}^{\infty} \frac{n}{\sqrt{n^5 + 1}}$ .

3. Discuss convergence of  $\sum_{n=0}^{\infty} \frac{n}{\sqrt{n^4 + 1}}$ .

## Review of main topics for Exam 1

### Chapter 10

$$\left\{ \begin{array}{l} \text{parametric equations} \\ \text{polar equations} \end{array} \right\} \longleftrightarrow \left\{ \begin{array}{l} \text{tangents, slopes} \\ \text{areas} \\ \text{arc lengths} \end{array} \right.$$

### Chapter 11

$$\text{sequences} \text{ --- } \left\{ \begin{array}{l} \text{reindexing} \\ \text{recursive definitions, unwinding recursions} \\ \text{Monotone Convergence Theorem (MCT)} \end{array} \right.$$

#### Series

$$\text{basics --- } \left\{ \begin{array}{l} \text{partial sums, limit definition} \\ \text{Geometric series (exact value)} \\ \text{Telescoping series (exact value)} \end{array} \right.$$

$$\text{series convergence --- } \left\{ \begin{array}{l} \text{\textit{n}th Term Test for Divergence} \\ \text{Integral Test (IT)} \\ \text{Yardstick Theorem and } p \text{ - series} \\ \text{Direct Comparison Test (DCT)} \end{array} \right.$$

Proofs, explanations, and derivations that are fair game

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Formula for tangent line to parametric

Arc length of polar curve from arc length of parametric

Why positive-termed series are either convergent + bounded, or else diverge to  $\infty$  and are unbounded.

$n$ th Term Test

Geometric series formula

Yardstick Theorem