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1. Do WebAssign 9.3. Remember that the WebAssign will be reopened three days before Exam III for you to review the problems. You will be allowed to improve your score by a maximum of three points. Additional attempts will not be given.

Do the series converge or diverge?

2.
$$\sum_{n=0}^{\infty} \frac{2}{\sqrt{2+n}}$$

3.
$$\sum_{n=0}^{\infty} \frac{2n}{1+n^4}$$

4.
$$\sum_{n=1}^{\infty} \left(\frac{1}{2}\right)^n + \left(\frac{2}{3}\right)^n$$

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5. Show $r^{\ln(n)} = n^{\ln(r)}$ for positive numbers n, r .

For what values $r > 0$ does $\sum_{n=1}^{\infty} r^{\ln(n)}$ converge?

Tests for Convergence

Section 9.4
October 25, 2016

Name:
Math 129 - 01

Understand	Compare a given series to a known, simpler series to determine convergence/divergence intuitively.
Understand	Use the Comparison Test or Limit Comparison Test as appropriate to confirm your intuition above.
Apply	Prove convergence of series with pos. & neg. terms by showing convergence of absolute value.
Apply	Use the Ratio Test to investigate convergence/divergence of a series.
Apply	Use the Alternating Series Test to investigate convergence/divergence of a series.
Apply	Know the difference between absolutely convergence and conditionally convergent series.
Synthesize	Given a series, decide which test(s) to apply to decide convergence/divergence.

1. To determine whether the series below converge or diverge, each of the series has been matched with the most appropriate test. For each series, show that all the requirements of the given test are met. The first one has been done for you.

$$\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{n} \quad \text{--- Alternating Series Test ---}$$

The terms can be re-written as $(-1)^{n-1}a_n$ for $a_n = \frac{1}{n}$. The terms are alternating, and a_n is positive and decreasing to 0.

$$\sum_{n=1}^{\infty} \frac{1}{n^3 + 1} \quad \text{--- Comparison Test ---}$$

$$\sum_{n=1}^{\infty} \frac{n-1}{n^3 + 3} \quad \text{--- Comparison Test ---}$$

$$\sum_{n=1}^{\infty} \frac{6n^2 + 1}{2n^3 - 1} \quad \text{--- Comparison Test ---}$$

$$\sum_{n=1}^{\infty} \frac{n^2 - 5}{n^3 + n + 2} \quad \text{--- Limit Comparison Test ---}$$

$$\sum_{n=1}^{\infty} \sin\left(\frac{1}{n}\right) \quad \text{--- Limit Comparison Test ---}$$

$$\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{n^2} \quad \text{Convergence by convergence of absolute values}$$

$$\sum_{n=1}^{\infty} \frac{1}{n!} \quad \text{--- Ratio Test ---}$$

Quiz (Leave this space blank)