Cuyamaca College
Math 280

Name:_____
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Practice Exam 3

1. Find a formula for the general term.

$$\left\{1, -\frac{1}{3}, \frac{1}{9}, -\frac{1}{27}, \frac{1}{81}, \ldots\right\}$$

2. Determine whether the series is convergent or divergent.

$$\sum_{n=1}^{\infty} \frac{1}{8n+1}$$

3. Determine whether the sequence is convergent or divergent. If it is convergent, find it's limit.

$$a_n = e^{1/n}$$

4. Determine whether the following sequence converges or diverges. If it converges, find the limit.

$$a_n = \frac{n}{(\ln n)^2}$$

5. Test the series for convergence or divergence.

$$\sum_{n=1}^{\infty} \frac{n}{\sqrt{n^7 + 5n + 1}}$$

6. Test the series for convergence or divergence.

$$\sum_{n=1}^{\infty} \frac{n^2 - 25}{n^2 + 5n}$$

7. Test the series for convergence or divergence.

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

8. Find the values of p for which the series is convergent.

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

9. Determine whether the sequence is increasing, decreasing, or not monotonic. Is the sequence bounded?

$$a_n = \frac{1}{2n + 3}$$

10. Test the series for convergence or divergence.

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

11. a) Use the integral test to show that the series converges.

$$\sum_{n=1}^{\infty} \frac{1}{n^2+1}$$

b) Find s_{10}

c) Use the error bounds from the integral test and your answer from part b) to find bound on the limit of the series.

Answers:

1. $a_n = \left(-\frac{1}{3}\right)^n$
2. Divergent by the divergence test
3. 1
4. Divergent
5. Convergent
6. Divergent
7. Convergent
8. Converges for p > 1. (Use the integral test, and a u-substitution with $u = x^2 + 1$)
9. Decreasing and bounded
10. Convergent
11. a) Convergent

    b) $s_{10} = 0.981793$

    c) $0.981793 + 0.09066 \le s \le 0.981793 + 0.099669$