

MA17300 Midterm Exam 3

Practice Test 1

Use the integral test to determine whether the series converges.

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

Use the Comparison Test to determine if the series converges or diverges.

$$2) \sum_{n=1}^{\infty} \frac{\sin n \cos n}{10^n}$$

Use the limit comparison test to determine if the series converges or diverges.

$$3) \sum_{n=1}^{\infty} \frac{10+9 \ln n}{3+5n(\ln n)^3}$$

Use the ratio test to determine if the series converges or diverges.

$$4) \sum_{n=1}^{\infty} \frac{(2n)!}{4^n n!}$$

Use the root test to determine if the series converges or diverges.

$$5) \sum_{n=1}^{\infty} \frac{n}{(3n^{1/n} - 1)^n}$$

Estimate the magnitude of the error involved in using the sum of the first four terms to approximate the sum of the entire series.

$$6) \sum_{n=1}^{\infty} \frac{(-1)^{n+1}(-0.4)^{2n+1}}{2n+1}$$

For what values of x does the series converge absolutely?

$$7) \sum_{n=1}^{\infty} \frac{x^n}{\sqrt{n^3+3}}$$

Use series to evaluate the limit.

$$8) \lim_{x \rightarrow 0} \frac{\sin^{-1} 9x - \sin 9x}{\tan^{-1} 9x - \tan 9x}$$

Find the sum of the series.

$$9) \frac{2}{3} - \frac{2^3}{3^3 \cdot 3!} + \frac{2^5}{3^5 \cdot 5!} - \frac{2^7}{3^7 \cdot 7!} + \dots$$

Answer Key

Testname: ME3PRAC1

- 1) diverges
- 2) converges
- 3) Converges
- 4) Diverges
- 5) Converges
- 6) -3.81×10^{-6}
- 7) $-1 \leq x \leq 1$
- 8) $-\frac{1}{2}$
- 9) $\sin \frac{2}{3}$