Calculus 2 Workbook

Ratio and root tests

krista king
MATH

RATIO TEST

■ 1. Use the ratio test to determine the convergence of the series.

$$\sum_{n=1}^{\infty} \frac{7^n}{n^3}$$

■ 2. Use the ratio test to determine the convergence of the series.

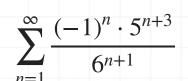$$\sum_{n=1}^{\infty} \frac{9(n+3)}{n^2}$$

■ 3. Use the ratio test to determine the convergence of the series.

$$\sum_{n=1}^{\infty} \frac{10^n}{5^{3n+1}(n+2)}$$

■ 4. Use the ratio test to determine the convergence of the series.

$$\sum_{n=1}^{\infty} \frac{6n+17}{3^{2n+1}}$$

■ 5. Use the ratio test to determine the convergence of the series.

$$\sum_{n=1}^{\infty} \frac{(-1)^n \cdot 5^{n+3}}{6^{n+1}}$$

RATIO TEST WITH FACTORIALS

■ 1. Use the ratio test to determine the convergence of the series.

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

■ 2. Use the ratio test to determine the convergence of the series.

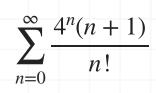$$\sum_{n=1}^{\infty} \frac{8^n}{2^{n+1} \cdot n!}$$

■ 3. Use the ratio test to determine the convergence of the series.

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

■ 4. Use the ratio test to determine the convergence of the series.

$$\sum_{n=0}^{\infty} \frac{(n+2)!}{(3n)^2 + 7}$$

■ 5. Use the ratio test to determine the convergence of the series.

$$\sum_{n=0}^{\infty} \frac{4^n(n+1)}{n!}$$

ROOT TEST

■ 1. Use the root test to determine the convergence of the series.

$$\sum_{n=3}^{\infty} \left(\frac{5n^3 + 3n^2 - 6}{\sqrt{6n^6 + 7n^4 - 8}} \right)^n$$

■ 2. Use the root test to determine the convergence of the series.

$$\sum_{n=1}^{\infty} \frac{7n^3}{e^{2n^2}}$$

■ 3. Use the root test to determine the convergence of the series.

$$\sum_{n=0}^{\infty} \left(\frac{7n - 6n^4}{9n^4 + 3} \right)^n$$

ABSOLUTE AND CONDITIONAL CONVERGENCE

■ 1. Use the root test to determine the absolute or conditional convergence of the series.

$$\sum_{n=1}^{\infty} \left(\frac{6n}{8n+5} \right)^n$$

■ 2. Use the ratio test to determine the absolute or conditional convergence of the series, or say if the series diverges of if the ratio test is inconclusive.

$$\sum_{n=1}^{\infty} \frac{(-1)^n}{25n}$$

■ 3. Use the root test to determine the absolute or conditional convergence of the series.

$$\sum_{n=1}^{\infty} \left(\frac{8n - 9n^5}{14n^5 + 7} \right)^n$$

■ 4. Use the ratio test to determine the absolute or conditional convergence of the series, or say if the series diverges of if the ratio test is inconclusive.

$$\sum_{n=1}^{\infty} \frac{n!}{9^n}$$