

1. Does the improper integral $\int_0^{\infty} \frac{1}{x^2+1} dx$ converge or diverge? (H)

(answer the convergent value if it converges or 'diverges')

2. Does the sequence $\{\frac{(-1)^n}{n!}\}$ converge or diverge? (I)

(answer the convergent value if it converges or 'diverges')

3. Evaluate the sum of $\sum_{n=2}^{\infty} [\frac{1}{n^2-1} + (\frac{1}{2})^{n-1}] =$ (I) .

4. Evaluate the sum of $\sum_{n=1}^{\infty} (\frac{1}{3^n} + \frac{2}{4n^2-1}) =$ (H)

5. Does the series $\sum_{n=1}^{\infty} \frac{(-1)^n 2n}{1+n}$ converge absolutely? converge conditionally or diverge? (I)

<p>1. Determine the series $\sum_{n=2}^{\infty} \frac{1}{n \ln n}$ converge or diverge? Explain your answer.</p>	<p>2. Determine the series $\sum_{n=1}^{\infty} \frac{\sqrt{n}}{n^2+1}$ converge or diverge? Explain your answer.</p>
<p>3. Dose the series $\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2}$ converge absolutely ? Converge conditionally? Or diverge? Explain your answer.</p>	<p>4. Dose the series $\sum_{n=1}^{\infty} \frac{(-1)^n}{n}$ converge absolutely ? Converge conditionally? Or diverge? Explain your answer.</p>

<p>5. Does the series $\sum_{n=1}^{\infty} (1 + \frac{1}{n})^n$ converge absolutely? Converge conditionally? Or diverge? Explain your answer.</p>	<p>6. Determine the series $\sum_{n=1}^{\infty} \frac{n^n}{n!}$ converge or diverge? Explain your answer.</p>
<p>7. Determine the convergence or divergence of $\sum_{n=1}^{\infty} \frac{\sqrt{n}}{n^2+1}$, explain why?</p>	<p>8. Find the Taylor polynomial P_4 of $f(x) = \ln x$ centered at $x=1$.</p>
<p>9. Find the Taylor series of $f(x) = \sin x$ expanded at $x = \frac{\pi}{3}$.</p>	<p>10. Find the power series of $\int e^{x^2} dx$ centered at $x=0$.</p>