Worksheet 9

Claudiu Raicu

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Determine whether the series is convergent or divergent. If it is convergent, find the sum.

1. $\sum_{n=1}^{\infty} \left(\frac{3}{5^n} - \frac{2}{n} \right).$

2. $\sum_{n=1}^{\infty} \frac{e^n}{n^4}.$

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

4. $\sum_{n=1}^{\infty} \ln \frac{n}{n+1}.$

5. If the nth partial sum of a series $\sum_{n=1}^{\infty} a_n$ is $s_n = 3 - n2^{-n}$, find a_n and $\sum_{n=1}^{\infty} a_n$.

Find the values of x for which the series converges. Find the sum of the series for those values of x.

6. $\sum_{n=1}^{\infty} (x-4)^n.$

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

8. $\sum_{n=1}^{\infty} \frac{\cos^n(x)}{2^n}.$

9. Find the values of p for which the series

$$\sum_{n=3}^{\infty} \frac{1}{n \ln(n)(\ln(\ln(n)))^p}$$

is convergent.

10. Find all positive values of b for which the series $\sum_{n=1}^{\infty} b^{\ln(n)}$ converges.