Series

Solutions should show all of your work, not just a single final answer.

1. Compute the following series *exactly*. Write "divergent" if it diverges.
   (a) $\displaystyle\sum_{n=1}^{\infty}\left(\frac{4}{11}\right)^n$
   (b) $\displaystyle\sum_{n=0}^{\infty}\frac{7^n}{4^{n+3}}$
   (c) $\displaystyle\sum_{n=0}^{\infty}7\cdot\frac{5^{n-1}}{3^{2n+1}}$
   (d) $\displaystyle\sum_{n=2}^{\infty}\frac{3^n-1}{4^n}$.

2. Determine the interval of all x for which the series $\displaystyle\sum_{n=0}^{\infty}(x/2)^n$ converges, and compute a formula for the series when it converges.

3. Use geometric series to convert the repeating decimal $.9\overline{34} = .934343434\ldots$ into a fraction in reduced form.

4. For the series $\displaystyle\sum_{n=1}^{\infty}\left(\frac{1}{n}-\frac{1}{n+3}\right)$, determine a formula for its Nth partial sum. If the series converges, determine its value exactly.

5. T/F (with justification): If $a_n \to 0$ as $n \to \infty$ then the series $\displaystyle\sum_{n=1}^{\infty}a_n$ converges.

6. T/F (with justification): The convergence of a series $\displaystyle\sum_{n=1}^{\infty}a_n$ is unaffected by dropping its first few terms.