CALCULUS 1501 WINTER 2010

HOMEWORK ASSIGNMENT 6.

Due February 26.

6.1. Determine whether the series
$$\sum_{n=1}^{\infty} \frac{1}{n^2 + 5n + 6}$$
is convergent or divergent. If it is convergent, find its sum.

6.2. Find the value of c such that $\sum_{n=1}^{\infty} 2^{nc} = 2010$.

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

6.4. Let $\sum_{n=1}^{\infty} a_n$ be a series with positive terms.

  (a) Suppose that for any $n \geq 1$, the partial sum S_n satisfies $S_n < 100$. Prove that $\sum_{n=1}^{\infty} a_n$ converges.

  (b) Suppose that for any $n \geq 1$,
$$a_n < \left(\frac{1}{2}\right)^n.$$

  Prove that $\sum_{n=1}^{\infty} a_n$ converges.

In both parts, you do not need to find the sum of the series.