Remember - We don't expect that everyone will solve every problem, but we do expect that everyone make a serious attempt at every problem and explain what you tried when you can't solve a problem.

Math 1220, Fall 2017

1) Give an explicit example of a convergent series $\sum_{k=1}^{\infty} a_k$ for which the ratio test is inconclusive. Do the same for a divergent series.

2) Does $\sum_{k=1}^{\infty} \frac{k}{3^k}$ converge or diverge? If it converges find its sum. (Hint for finding the limit S of the series: what is $3S - S$?)

3) Consider the alternating series $\sum_{k=1}^{\infty} \frac{(-1)^{k-1}}{k}$. One can prove this converges to $\log 2$. The base of the logarithm is, of course, e. Can you rearrange the terms to get a sum of -7?