

# Real Analysis - HW#6

Note Title

9/24/2012

① In class we proved that  $\sum_{n=1}^{\infty} \left(\frac{1}{2}\right)^n$  converges to 1 by looking at the sequence of partial sums

a) Prove that  $\sum_{n=0}^{\infty} \left(\frac{3}{4}\right)^n$  converges and find the limit. (similar to class work)

b) Since  $\sum_{n=1}^{\infty} \left(\frac{1}{2}\right)^n$  converges,  $\sum_{n=4}^{\infty} \left(\frac{1}{2}\right)^n$  also converges. Find the limit.

c) Find the limit of  $\sum_{n=10}^{\infty} \left(\frac{7}{8}\right)^n$

② Find a rearrangement of the alternating harmonic series so that the sum of the first few terms is within 0.05 of 1.3.

③ For which series can you use the Divergence Test to show it diverges:

a)  $\sum_{n=1}^{\infty} \sqrt[n]{n}$

b)  $\sum_{n=1}^{\infty} \frac{1}{n^2}$

c)  $\sum_{n=1}^{\infty} \frac{n^2}{2^n}$

d)  $\sum_{n=1}^{\infty} \left(1 + \frac{1}{n}\right)^n$