

Math 182 Honors Quiz 12 Version A

1. Prove that if  $a_n$  is a monotonic decreasing sequence with limit 0, then the alternating series  $\sum_{n=1}^{\infty} (-1)^{n-1} a_n$  converges.

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2. Test the following series for convergence or divergence and give a reason for your decision in each case.

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

(ii) 
$$\sum_{n=1}^{\infty} \frac{1}{(\log(n+1))^6}$$

(iii) 
$$\sum_{n=1}^{\infty} \frac{n+1}{2^n}$$