Math 101 – WORKSHEET 26
THE COMPARISON TEST

1. Comparison by Massaging

(1) Determine, with explanation, whether the following series converge or diverge.
   (a) (Final 2014) $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n^2+1}}$

   (b) (Final 2013, variant) $1 + \frac{1}{9} + \frac{1}{25} + \frac{1}{49} + \frac{1}{81} + \frac{1}{121} + \cdots$

   (c) (Final 2013) $\sum_{n=1}^{\infty} \frac{n+\sin n}{1+n^2}$

   (d) $1 + \frac{1}{2^3} + \frac{1}{3^2} + \frac{1}{4^3} + \frac{1}{5^2} + \frac{1}{6^3} + \frac{1}{7^2} + \cdots$

Date: 11/3/2016, Worksheet by Lior Silberman. This instructional material is excluded from the terms of UBC Policy 81.

2. Limit comparison test

(2) Determine, with explanation, whether the following series converge or diverge.

(a) (Final 2014) $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n^2+1}}$

(b) (Final 2013, variant) $1 + \frac{1}{9} + \frac{1}{25} + \frac{1}{49} + \frac{1}{81} + \frac{1}{121} + \cdots$

(c) (Final 2013) $\sum_{n=1}^{\infty} \frac{n+\sin n}{1+n^2}$