

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) $1 + \frac{1}{9} + \frac{1}{25} + \frac{1}{49} + \frac{1}{81} + \frac{1}{121} + \dots$

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

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

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