

## MA 114 Worksheet # 5: Series with Positive Terms

1. Use the Integral Test to determine if the following series converge or diverge:

(a)  $\sum_{n=0}^{\infty} \frac{1}{1+n^2}$

(b)  $\sum_{n=1}^{\infty} n^2 e^{-n^3}$

(c)  $\sum_{n=2}^{\infty} \frac{n}{(n^2+2)^{3/2}}$

2. Show that the infinite series  $\sum_{n=1}^{\infty} \frac{1}{n^p}$  converges if  $p > 1$  and diverges otherwise by Integral Test.

3. Use the Comparison Test (or Limit Comparison Test) to determine whether the infinite series is convergent or divergent.

(a)  $\sum_{n=1}^{\infty} \frac{1}{n^{3/2} + 1}$

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

(c)  $\sum_{n=1}^{\infty} \frac{2^n}{2+5^n}$

(d)  $\sum_{n=0}^{\infty} \frac{4^n + 2}{3^n + 1}$

(e)  $\sum_{n=1}^{\infty} \frac{n!}{n^4}$

(f)  $\sum_{n=0}^{\infty} \frac{n^2}{(n+1)!}$