MAT 271 – Calculus II
Sample Test 4
Instructor: Rafael Pacheco

NAME: ___________________________________________

ASU ID # _______________________________ Section No. __________________________

Note: All work to be shown on the pages provided for full credit, use reverse side if necessary. No books, notes or calculators of any kind are permitted. No time limit. Each problem is worth 10 points.

1. Determine whether the series is convergent or divergent:
   (1) \(-2 + \frac{5}{2} - \frac{25}{8} + \frac{125}{32} - \ldots\)
   (2) \(\sum_{n=1}^{\infty} \frac{1}{5 + 2^{-n}}\)
   (3) \(\sum_{n=1}^{\infty} (x - 4)^n\)

2. Use the integral test to determine whether the series is convergent or divergent:
   (4) \(\sum_{n=3}^{\infty} \frac{1}{n \ln n \ln(\ln n)}\)

3. Find the values of \(p\) for which the series is convergent.
   (5) \(\sum_{n=2}^{\infty} \frac{1}{n(\ln n)^p}\)

4. Using the comparison test determine whether the series is convergent or divergent:
   (6) \(\sum_{n=1}^{\infty} \frac{\sin^2 n}{n^{\sqrt{n}}}\)
   (7) \(\sum_{n=1}^{\infty} \frac{2}{n^3 + 4}\)
   (8) \(\sum_{n=1}^{\infty} \sin \left(\frac{1}{n}\right)\)
(9) \[ \sum_{n=1}^{\infty} \frac{n!}{n^n} = \]

5. Determine whether the series is convergent or divergent:

(10) \[ \sum_{n=1}^{\infty} \frac{(-1)^n n^n}{n!} = \]

(11) \[ \sum_{n=1}^{\infty} \frac{\cos(n \pi)}{n^{3/4}} = \]