

Quiz Date: October 23, 2017

**Instructions:** The following exercises are similar to those found in the course text book. This homework is not due for a grade, but you should know how to do all of them and be able to show your work for each. You can expect at least one of these problems to appear on an in-class quiz on the date listed above.

## 8.1 - Sequences

- Find a formula for the general term  $a_n$  of the sequence, assuming that the pattern for the first few terms continues.  $\{\frac{1}{2}, -\frac{4}{3}, \frac{9}{4}, -\frac{16}{5}, \frac{25}{6}, \dots\}$
- Determine whether the sequence converges or diverges. If it converges, find the limit.

a.  $a_n = 1 - (0.2)^n$

b.  $a_n = \frac{3^{n+2}}{5^n}$

c.  $a_n = \frac{(-1)^n}{2\sqrt{n}}$

## 8.2 - Series

- Determine whether the geometric series is convergent or divergent. If it converges, find its sum.

a.  $2 + 0.5 + 0.125 + 0.03125 + \dots$

b.  $\sum_{n=1}^{\infty} \frac{10^n}{(-9)^{n-1}}$

- Determine whether the series is convergent or divergent. If it is convergent, find its sum.

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

c.  $\sum_{k=1}^{\infty} (\cos 1)^k$

b.  $\sum_{n=1}^{\infty} \frac{1+2^n}{3^n}$

d.  $\sum_{n=1}^{\infty} \ln\left(\frac{n}{n+1}\right)$

## 8.4 - Other Convergence Tests

- Determine whether the series is absolutely convergent, conditionally convergent, or divergent.

a.  $\sum_{n=1}^{\infty} \frac{n}{5^n}$

c.  $\sum_{n=0}^{\infty} \frac{(-3)^n}{(2n+1)!}$

b.  $\sum_{n=0}^{\infty} \frac{(-10)^n}{n!}$

d.  $\sum_{k=1}^{\infty} k\left(\frac{2}{3}\right)^k$