**Math 172 Quiz 10.2b** **Name:** _____

Sections: 10.1-10.2 Point values in boxes.

25 October 2018

1. [3] Please circle **T**rue or **F**alse, as appropriate.

   (a) (T) / F: If $a_n \to 0$ as $n \to \infty$, the sequence $\{a_n\}$ converges.

   (b) T / (F): If $a_n \to 0$ as $n \to \infty$, the series $\sum a_n$ converges.

   (c) T / (F): If $a_n \to 0$ as $n \to \infty$, the series $\sum a_n$ diverges.

   (d) (T) / F: If $a_n \to 1$ as $n \to \infty$, the sequence $\{a_n\}$ converges.

   (e) T / (F): If $a_n \to 1$ as $n \to \infty$, the series $\sum a_n$ converges.

   (f) (T) / F: If $a_n \to 1$ as $n \to \infty$, the series $\sum a_n$ diverges.

2. [2] State the Divergence Test.

   If $a_n \not\to 0$ as $n \to \infty$ then $\sum a_n$ diverges.

3. [2] Use the Divergence Test to show the following series diverges.

$$\sum_{n=0}^{\infty} \frac{n}{n+2}$$

   Since $\frac{n}{n+2} \xrightarrow{n\to\infty} 1 \neq 0$, by the Divergence Test

$$\sum_{n=0}^{\infty} \frac{n}{n+2} \text{ diverges}$$

4. [1] For $c \neq 0$, the Geometric Series $\sum_{n=0}^{\infty} cr^n$ converges to $\frac{c}{1-r}$ for $|r| < 1$ and diverges for $|r| \geq 1$.

5. [2] For what values of $x$ does the following converge? For those $x$, find the sum.

$$\sum_{n=0}^{\infty} x^n = \frac{1}{1-x} \quad \text{for } |x| < 1$$