Quiz 6

NAME:_____

RECITATION : Mon8 Mon9 Wed8 Wed9

1. Determine if the following sequence converges or diverges. If it converges, find its limit.

$a_n = (\frac{n+1}{2n})(1 - \frac{1}{n})$

$$\lim_{n\to\infty} a_n = \left(\lim_{n\to\infty}\left(\frac{n+1}{2n}\right)\right)\left(\lim_{n\to\infty}\left(1-\frac{1}{n}\right)\right)$$

$$= \left(\lim_{n\to\infty}\left(\frac{1+\frac{1}{n}}{2}\right)\right)\left(\lim_{n\to\infty}\left(1-\frac{1}{n}\right)\right)$$

$$= \frac{1}{2} \cdot 1 = \frac{1}{2}$$

2. Determine whether the series $\sum_{n=0}^{\infty} \frac{(-1)^n}{7^n}$ converges or diverges. If convergent, compute the sum.

$$= \sum_{n=0}^{\infty} \left(\frac{-1}{7}\right)^n = \frac{1}{1-\left(\frac{-1}{7}\right)}$$

$$= \frac{1}{\frac{8}{7}}$$

$$= \boxed{\frac{7}{8}}$$