

## Quiz 6

NAME: \_\_\_\_\_

RECITATION: Mon8 Mon9 Wed8 Wed9

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

$$a_n = \frac{n+3}{n^2+5n+6}$$

$$a_n = \frac{n+3}{(n+3)(n+2)} = \frac{1}{n+2}$$

$$\lim_{n \rightarrow \infty} \frac{1}{n+2} = 0$$

converges to 0

$$\sum_{n=0}^{\infty} 5 \cdot \frac{2^n}{3^n}$$

2. Determine whether the series ~~converges or diverges~~ converges or diverges.

$$\begin{aligned} \sum_{n=0}^{\infty} 5 \cdot \frac{2^n}{3^n} &= \sum_{n=0}^{\infty} \left(\frac{2}{3}\right)^n = \frac{1}{1 - \frac{2}{3}} \\ &= \frac{1}{\frac{1}{3}} = \boxed{\frac{5}{3}} \end{aligned}$$