Homework 1

1. Determine the convergence or divergence of the sequence with the given *n*th term. If the sequence converges, find its limits

(a) $a_n = \frac{\sin n}{n^2}$

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

(c) $a_n = \frac{n+1}{e^n}$

2. Determine whether the series converges or diverges. For convergent series, find the sum of the series.

(a) $\sum_{k=0}^{\infty} 3(\frac{1}{5})^k$

(b) $\sum_{k=0}^{\infty} \frac{1}{2}(3)^k$

(c) $\sum_{k=1}^{\infty} \frac{4}{k(k+2)}$