Assignment 1

1. Determine the convergence or divergence of the sequence with the given nth term. If the sequence converges, find its limit.
$$a_n = \frac{\ln(n^3)}{2n}$$

2. Find the sum of the convergent series.
$$\sum_{n=0}^{\infty} [(0.3)^n + (0.8)^n]$$

3. Determine the convergence or divergence of the series.
$$\sum_{n=1}^{\infty} \left(\frac{1}{n} - \frac{1}{n+2}\right)$$

4. Use the Integral Test to determine the convergence or divergence of the series.
$$\frac{\ln 2}{\sqrt{2}} + \frac{\ln 3}{\sqrt{3}} + \frac{\ln 4}{\sqrt{4}} + \frac{\ln 5}{\sqrt{5}} + \frac{\ln 6}{\sqrt{6}} + \dots$$