MATH 140A Review: Sequences and Series

1. Determine if the following series converges. If so, what is the sum?

$$\sum_{n=2}^{\infty} \left(\frac{1}{\sqrt{n-1}} - \frac{1}{\sqrt{n}} \right).$$

2. Determine if the following series converges. If so, what is the sum?

$$\sum_{n=1}^{\infty} \left(\pi^{-n} + 2^{n+1} 4^{-n} \right).$$

3. If the nth partial sum of a series $\sum_{n=1}^{\infty} a_n$ is

$$S_N = 2 + e^{-N},$$

then find a_n and $\sum_{n=1}^{\infty} a_n$.