1. Use the formula for the value of a convergent geometric series to show that if \( N = 61 \), the geometric series \( \sum_{k=N}^{\infty} 100 \cdot \left( \frac{5}{6} \right)^k \) converges to a number \( S \) which satisfies \( S < 0.01 \). (Find \( S \) as a decimal number to as many places as your calculator shows). (You are not finding \( N = 61 \) from scratch, just verifying it’s correct) Show your work including the formula involved.

2. By the series comparison test and problem (1), \( \sum_{k=10}^{\infty} \frac{100}{1.2^k + \sqrt{k}} \) should converge to some number \( Q \), and problem (1) says that the partial sum \( \sum_{k=10}^{60} \frac{100}{1.2^k + \sqrt{k}} \) should give the value of \( Q \) to within 0.01. Use the LHS program on your calculator to find this partial sum to as many places as your calculator displays. Also, write down what you used for \( A, B \) and \( N \).

\[
A = \square \quad B = \square \quad N = \square \quad Q = \underline{\quad} 
\]

3. What does the \( n \)th term test say about the convergence/divergence of a series \( \sum a_k \)?

4. What is the alternating harmonic series (call it AHS)? (write it down to at least the first six terms).