MATH 170 – Section 009 – Quiz 7

You may work with other class members on this quiz, but you may not receive assistance from people not in MATH 170 (Section 009). You must show all of your work to receive full credit. Do all your work on other sheets of paper and be sure to staple all the pieces of paper together or YOU WILL GET A ‘ZERO’ ON THE QUIZ. Do not use decimal approximations unless asked to do so. Your work on this quiz must be handed in by Thursday, 20 October 2005 at 1900. GOOD LUCK!

1) Prove:

\[
\frac{d}{dx} (\cosh x) = \sinh x
\]

2) Prove:

\[
\cosh^{-1} x = \ln \left( x + \sqrt{x^2 - 1} \right)
\]

3) Prove:

\[
\frac{d}{dx} (\cosh^{-1} x) = \frac{1}{\sqrt{x^2 - 1}}
\]

4) Use the technique of linearization to estimate \(\sqrt{99}\). Is your answer an overestimate or an underestimate of the exact value of \(\sqrt{99}\)? Explain without resorting to a calculator.