MATH 170 – Section 008 – 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 008). 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 Monday, 14 March 2005 at 1540. GOOD LUCK!

1) Prove:
\[
\frac{d}{dx} (e^{-x} \sinh x) = e^{-2x}
\]
using two different techniques.

2) Use linearization to estimate \( \sqrt{35} \). Is your answer and overestimate or an underestimate? Explain. You may not use a calculator.

3) Find all critical numbers of \( f(x) = \sin^2 x - \cos x \).

4) Find all critical numbers of \( f(x) = x^{2/3} (3 - 2x) \).

5) A box with a square base and without a top is to be constructed. The volume of the box must be 3200 in\(^3\). The base of the box costs 0.04 cents per square inch while the four sides of the box costs 0.05 cents per square inch. Determine the dimensions of the box that will minimize its cost. What is the cost in this case?