MATH 170 – Section 006 – Quiz 9

You may work with other class members on this quiz, but you may *not* receive assistance from people not in your MATH 170 section. 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 the beginning of class on Friday, 13 November 2009. GOOD LUCK!

1) Prove that the equation

$$x^3 + 4x - 50 = 0$$

has exactly one solution.

2) Suppose that f is a function that is continuous and differentiable everywhere. Suppose $f(1) = 2$ and that $f'(x) > 3$ for all x. Using the Mean Value Theorem, what conclusion can you reach concerning the value of $f(4)$?

3) Prove the identity:

$$\arcsin x + \arccos x = \frac{\pi}{2}.$$

4) Let

$$f(x) = 3x^{8/5} - 32x^{3/5}.$$

a) What is the domain of f?

b) Find all critical points of f.

c) Determine where f is increasing and where it is decreasing.

d) Classify each critical point as a local maximum, a local minimum, or neither.