

MATH 170 – Sections 003 and 004 – Quiz 10

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 pieces of paper and be sure to staple together all the pieces of paper 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, 21 April 2006. Good luck!

1) Consider the equation

$$x = \cos x \quad (1)$$

a) Use the Intermediate Value Theorem to prove that (1) has a solution.

b) Use Newton's method to estimate this solution. Stop when you are convinced that your answer is accurate to five places to the right of the decimal point (here, of course, we use decimal approximations).

2) Find the most general antiderivative of the function

$$f(x) = \sqrt[3]{x} - \sin x + x^{-1} - e^x + 2.$$

3) A hot air balloon is rising vertically at 48 ft/sec when a package is dropped from it. The package hits the ground 8 seconds later. How high was the balloon when the package was dropped? We assume air resistance is negligible; thus the acceleration of the package is due only to gravity, the magnitude of which is 32 ft/sec². For what values of time is your model valid? Explain.