

## MATH 170 – Section 008 – Quiz 11

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, 25 April 2005 at 1540. GOOD LUCK!

1) Let

$$f(x) = \begin{cases} -2x - 3 & \text{if } x \leq -1 \\ -1 - \sqrt{1 - x^2} & \text{if } -1 \leq x < 1 \\ x - 2 & \text{if } x \geq 1 \end{cases}$$

Without using the Fundamental Theorem of Calculus, evaluate

$$\int_2^{-3} f(x) dx.$$

2) Express the limit

$$\lim_{n \rightarrow \infty} \sum_{i=1}^n \frac{i^2}{n^3}$$

as a definite integral. Then evaluate the integral.

3) Find the derivative of each function:

a)  $\int_{-2}^x \cos^2 5t dt$

b)  $\int_{-2}^{x^2} \cos^2 5t dt$

c)  $\int_x^{x^2} \cos^2 5t dt$

4) Evaluate:

a)  $\int_1^2 \frac{dt}{t}$

b)  $\int_1^4 \frac{3 + \sqrt{x}}{x^4} dx$

c)  $\int_{-\sqrt{3}}^1 \frac{1}{1 + t^2} dt$