

MATH 170 – Section 009 – Quiz 9

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, 10 November 2005 at 1900. GOOD LUCK!

1) Compute the following limits:

a) $\lim_{x \rightarrow 0} \frac{\sin^2 x}{\cos x - 1}$

b) $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x^2}$

c) $\lim_{x \rightarrow 0^+} (\sin x)^x$

2) Sketch the graph of

$$y = x^2 \ln x$$

by obtaining and using all the following information: domain of the function, intercepts, symmetry, asymptotes, intervals where the graph is increasing/decreasing, local maximum and minimum points, intervals where the graph is concave up/concave down, inflection points. There will be times when using decimal approximations will be helpful; nonetheless, all answers should be given exactly.

3) A zoo keeper needs to construct four adjacent (i.e, side-by-side) cages of equal size from an area of 5200 m^2 . The cost of the fencing that separates adjacent cages is \$60 per meter while the cost of the fencing for the perimeter is \$40 per meter. Find the size of each cage if the total cost of fencing is to be minimized. What is the total cost in this case?