MATH 1120 **Quiz 1** **Summer 2001**

Name : _____

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1. A manufacturer has a monthly fixed cost of \$200,000 and a production cost of \$100 for each unit produced. The product sells for \$200 per unit. The manufacturer produces x units per month. In this case,

   (a) the cost function $C(x) =$

   (b) the revenue function $R(x) =$

   (c) the profit function $P(x) =$

   (d) when the manufacturer produces 10,000 units per month, the value of the profit $P(10,000) =$

2. Let $f(x) = x^3 - 2x$ and $g(x) = 4x + 1$.

   (a) Find $f(g(x)) =$

   (b) Find $g(f(x)) =$

3. Find the following limits:

   (a) $\lim_{x\to 1} x^2 + 2x + 1 =$

   (b) $\lim_{x\to 3} \frac{x^2-9}{x-3} =$

   (c) $\lim_{x\to\infty} \frac{6x^2+5x+10}{2x^2+3x-6} =$

4. For the following pair of supply and demand equations, where x represents the quantity demanded in units of a thousand and p the unit price in dollars, find the equilibrium quantity and price:

$$p = 0.1x^2 + x + 60, \qquad p = -0.2x^2 - 0.5x + 150.$$

5. (a) Find the slope of the tangent line to the graph of $y = 2x^2$ at the point $(1, 2)$.

   (b) Find an equation of the tangent line to the graph of $y = 2x^2$ at the point $(1, 2)$.