Calculus I, MAT 1214 (2–5)
Midterm, March 8,1995
Instructor: D. Gokhman

Name: _____

1. (30 pts.) Find the following limits (show work):

$$\text{(a) } \lim_{x \to 0} \frac{x}{\tan(x)} \qquad \text{(b) } \lim_{x \to 0^-} \frac{2x + |x|}{|x|} \qquad \text{(c) } \lim_{x \to 0} x \cos\left(\frac{1}{x^2}\right)$$

2. (30 pts.) Differentiate each of the following functions:

$$\text{(a) } x^2 \sin^2(x^2) \qquad \text{(b) } \frac{3x}{x^2 + 1} \qquad \text{(c) } \sqrt{\cos(x)}$$

3. (20 pts.) Find an equation for the line that is perpendicular to the graph of $y = x^2$ and passes through the point $(-3, 0)$.

4. (30 pts.) Find the critical points of the function $f(x) = 3x^4 + 8x^3 - 18x^2 + 100$. Find the minimum and maximum values of this function in the interval $[0,2]$.

1	2	3	4	total (110)