MAT 175 HOMEWORK #1

DUE 2/13 (MONDAY)

Note: *Please* **staple** *if necessary. Numbering of problems is as in the course textbook.*

(1.7.**6**) Find the indicated limit or state that it does not exist:

$$\lim_{z\to 2} \frac{z^2-4}{z^2+z-6}$$

(1.7.**14**) Find the indicated limit or state that it does not exist:

$$\lim_{x\to 1^-} \frac{|x-1|}{x-1}$$

(2.10.**12**) Find the indicated derivative:

$$D_t\left(t\sqrt{2t+6}\right)$$

(2.10.**22**) Find the indicated derivative:

$$\frac{d}{dx}\left(\frac{\sin 3x}{\cos 5x^2}\right)$$

(2.10.**42**) Show that the tangent lines to the curves $y^2 = 4x^3$ and $2x^2 + 3y^2 = 14$ at $(1, 2)$ are perpendicular to each other. (*Hint*: Use implicit differentiation.)

(3.10.**10**) Let

$$f(x) = (x-1)^3(x+2)^2 \quad \text{on } [-2, 2]$$

Determine the critical points, evaluate f at these points, and find the global maximum and minimum values of f on the given interval.

(3.10.**42**) A page of book is to contain 27 square inches of print. If the margins at the top, bottom, and one side are 2 inches and the margin at the other side is 1 inch, what size page would use the least paper?

(4.7.**2**) Evaluate the indicated integral:

$$\int_1^2 \frac{2x^4-3x^2+1}{x^2}\,dx$$

(4.7.**6**) Evaluate the indicated integral:

$$\int_0^{\pi/2} \cos^4 x \sin x\,dx$$

(4.7.**10**) Evaluate the indicated integral:

$$\int_2^3 \frac{y^2-1}{(y^3-3y)^2}\,dy$$