Calculus I
Exam 2, Summer 2002

1. A curve C in the plane is the graph of the relation $x^3 - xy^2 + y + x^2 = 2$. Find the equation of the tangent line to the curve at the point (-1,2).

2. A lamp is being lowered down a vertical pole at a rate of 3 ft/sec. A 6 foot man stands 20 feet away from the pole. At what rate is the shadow of the man lengthening when the lamp is 56 feet off the ground?

3. Let $y = (x^2 - 1)(x^2 - 5)$. For what value of x in the interval [-2,2] is y a maximum? a minimum? Find the points of inflection of the graph.

4. I have to make a closed cylindrical can to hold 12 cu. ft. The material to make the top and bottom costs $6 a sq. ft., and the material to make the side costs $10 per sq. ft. What are the dimensions which minimize the cost? (It wil suffice to give either the radius of the base or the height.

5. $y = \dfrac{x(x-2)}{x^2-1}$ You must show enough work to explain how you found the various features of the graph.