

Calculus I
Exam 2, Fall 2002

1. A curve C in the plane is the graph of the relation $y^3 - xy^2 + x^3 = 5$. Find the equation of the tangent line to the curve at the point $(2,-1)$.
2. A cylindrical balloon is being inflated so that its volume is increasing at the rate of 3 in^3 per second. Assuming that the length of the balloon is held constantly at 9 in. , at what rate is the radius increasing when it is 2 in. ? (The volume of a cylinder is $V = \pi r^2 h$.)
3. Let $y = (x^2 - 2)(x + 5)$. Find all local maxima, local minima and points of inflection of the graph.
4. Let $y = \sin x + \cos x$. Where between $-\pi/2$ and $\pi/2$ is there a critical point? Is this a maximum or a minimum?
5. $y = \frac{x^2}{(x-1)(x-2)}$ You must show enough work to explain how you found the various features of the graph.