

Exam #2

Math 121-H

Thursday, October 9, 2003

For full credit show all work. When in doubt, explain your reasoning.

1. Explain what a derivative tells you about a point on a curve.
2. Use the definition of derivative as $\Delta y/\Delta x$ as $\Delta x \rightarrow 0$ to find the derivative of $y = 2x - x^2$.
3. Sketch a graph of the following parametric curve: $x = t^3 - t$, $y = t^3 + t$, where $-1 \leq t \leq 1$. Indicate the orientation of the curve on your graph.
Also: use $y - x$ to solve for t and come up with an equation for the curve in rectangular form.
4. Find the slope of the curve $y = x\sqrt{x^2 + 1}$ when $x = 3/4$.
5. Use the derivative to find when the following curve is horizontal.

$$y = \frac{x}{x^3 + 1}$$