

## Math 121 Final Exam Topics

1. Curve sketching. Make a sign chart for the first and second derivative, identify critical points, points of inflection, intervals where the function is increasing and decreasing, concave and concave down, and any horizontal or vertical asymptotes. See Section 4.4.
2. Solve an optimization problem. Requires that you give a formula for  $f(x)$  given a verbal description, find the domain, find all critical points, find all boundary points. You may or may not need to apply the second derivative test at the interior critical points. See Section 4.5.
3. Use Newton's Method to solve  $f(x) = 0$ . See Section 4.6.
4. Solve a motion problem using the method of antiderivatives and  $a(t) = -32$  ft/sec/sec or  $a(t) = -9.8$  m/sec/sec. See Section 4.7.
5. Approximate a definite integral using a Riemann sum and a given number of intervals  $N$ . See Sections 5.1 and 5.2.
6. Compute a definite integral using the Fundamental Theorem of Calculus. See Section 5.3.
7. Solve an applied problem using a definite integral as in Section 5.3.
8. Compute an indefinite integral (antiderivative) using the substitution method. See Section 5.5.