

MATH 113 - MAPLE ASSIGNMENT 3 - DUE December 6, 2010

Answer all the following questions. You are expected to turn in a printout of a Maple worksheet containing the Maple commands and outputs that you used to complete the assignment. This assignment is due by December 6, 2010.

1. (15pts) Let  $F(x) = \int_a^x f(t)$  for the specified function  $f(x) = x^3 - 4x^2 + 3x$  and interval  $[a, b] = [0, 4]$ 
  - (a) Plot the functions  $f$  and  $F$  together over  $[a, b]$ . (Hint: Use this command for the integral, `int(f,a..b)`).
  - (b) Solve the equation  $F'(x) = 0$ . What can you see to be true about the graphs of  $f$  and  $F$  at the points where  $F'(x) = 0$ ?
  - (c) Over what intervals (approximately) is the function  $F$  increasing and decreasing? What is true about  $f$  over those intervals?
2. (10pts) Find the indefinite integrals of the following functions.
  - (a)  $f(x) = x^3(1 + x^4)^3$
  - (b)  $f(x) = \frac{\sqrt{\arctan(x)}}{1+x^2}$