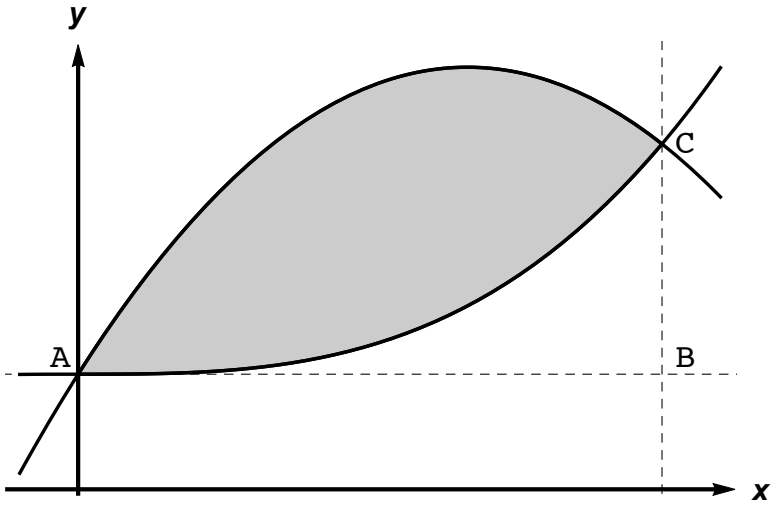
Math 220 U1 **Quiz 11** **Fall 2014**

Name _____

- You may work with other students in our class. However each student should write up solutions separately and independently – nobody should copy someone else's work.
- You may use your notes, the textbook, and past homework / worksheets.
- You may use a calculator only for basic arithmetic. In particular you should not use its graphing features.
- You are not allowed to search the internet, use wolfram|alpha, or use technology for anything beyond what is stated above.
- The quiz is due at the beginning of class on **Wednesday, 10 December** by 9:05am.
- There is a higher expectation for the quality of your work on a take-home quiz. Everything should be written logically and legibly with sufficient work to justify each answer. Blank copies of the quiz are available on the course webpage.
- Be sure that the pages are nicely stapled – do not just fold the corners.
- I will tell the TAs in the tutoring room that they are not allowed to help you on this quiz, so don't even try to ask them for help.

1. The functions $y = x^3 + 1$ and $y = 1 + 4x - 3x^2$ are plotted below. The shaded area represents the region enclosed by these curves in the first quadrant.



(a) (1 point) Determine the points of intersection A and C.

(b) (1 point) Determine equations for the lines $\overline{AB}$ and $\overline{BC}$.

(c) (4 points) Set up, but **do not evaluate**, an integral that represents the volume of the solid obtained by rotating the shaded region about the line $\overline{AB}$.

(d) (4 points) Set up, but **do not evaluate**, an integral that represents the volume of the solid obtained by rotating the shaded region about the line $\overline{BC}$.