Bender Math 21C First Midterm Oct. 21, 2002

- PRINT NAME _____
- Write version on your blue book and hand in this exam inside your blue book. VERSION A
- Put your name, ID number, and section number (or time) on your blue book.
- You may have ONE PAGE of notes. NO CALCULATORS are allowed.
- **You must show your work to receive credit.**

1. (30 pts.) A curve is given parametrically by

$$x = 2t^3 + 3t^2 - 1 \quad \text{and} \quad y = t^2 - 3t + 2 \quad \text{for} \quad -4 \leq t \leq 2.$$

   (a) Write down an integral for the length of the curve. Do **NOT** evaluate the integral.

   (b) Find those points where the curve is **VERTICAL**; that is, give their x and y coordinates.

2. (30 pts.) The three points $A\ (2, 1, 0)$, $B\ (1, 0, 1)$ and $C\ (x, 3, 4)$ form the vertices of a right triangle **whose right angle is at** A.

   (a) Find x.

   (b) Find the cosine of the angle whose vertex is C.

3. (40 pts.) Consider the two planes described as follows:

   First plane: It is perpendicular to the vector $\langle 1, 2, 0\rangle$ and contains the origin.

   Second plane: It contains the origin and the line given parametrically by

$$\langle x, y, z\rangle = t\langle 1, 1, 0\rangle + \langle 0, 2, 0\rangle.$$

   (a) Write down equations for the two planes.

   (b) Write a parametric equation for line of intersection of the two planes.

END OF EXAM