- 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

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

  (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