

SPRING 2006 — MA 227-6D — TEST 1

Name: _____

1. PART I

There are 5 problems in Part 1, each worth 4 points. Place your answer on the line to the right of the question. No partial credit will be given on Part 1 problems, only your answer on the answer line will be graded.

(1) Find the dot product of the vectors $\langle 2, 5, 2 \rangle$ and $\langle 1, -2, -1 \rangle$. _____

(2) Find the cross product of the vectors $\langle 0, 4, -3 \rangle$ and $\langle -1, 0, 1 \rangle$. _____

(3) Find the derivative of the vector function $\langle 1, t, t^2 \rangle$. _____

(4) Find the derivative of the vector function $\langle \cos t, \cos(2t), t \sin t \rangle$.

(5) Compute $\int_0^3 \langle 2, 1 + t, e^t \rangle dt$. _____

2. PART II

There are 2 problems in Part 2, each worth 10 points. On Part 2 problems partial credit is awarded where appropriate. Your solution must include enough detail to justify any conclusions you reach in answering the question.

- (1) A parallelepiped is spanned by the vectors $\langle 4, 2, 2 \rangle$, $\langle 0, -1, 1 \rangle$, and $\langle 2, 1, -1 \rangle$. Find volume and surface area of the parallelepiped.

- (2) At what point does the curve $y = x^3$, $x > 0$ have maximum curvature? What is the curvature at this point?