MA 126, CALCULUS II

Spring, 2016

Name (Print last name first): .....

Student Signature: .....

TEST III

11 questions, 10 points each. SHOW ALL YOUR WORK!

Question 1

Calculate the cross product of $\mathbf{r}_1 = (2, -1, 1)$ and $\mathbf{r}_2 = (1, 2, -1)$.

Answer: .....

Question 2

Let $\mathbf{r}(t) = (6t^{-1/3}, t^2, e^{t^3-1})$. Find $\mathbf{T}(1)$.

Answer: .....

Question 3

Let $\mathbf{r}(t) = (t-1,\, t^3,\, t^2)$. Find SYMMETRIC equation of the tangent line at point $t = 1$.

Answer: .....

Question 4

Find parametric equation of the line which passes through the point $(1, 0, 1)$ and is orthogonal to the plane $2x + y - z + 2 = 0$.

Answer: .....

Question 5

Find the area of the parallelogram generated by the vectors $(1, -1, 1)$ and $(-2, 1, 2)$.

Answer: .....

Question 6

Find equation of the plane containing the points $(0, 1, 1)$, $(1, 1, -2)$ and $(-1, 0, 1)$.

Answer: .....

Question 7

a) Find equation of the plane which passes through the point $(1, -1, 1)$ and is parallel to the plane $x + 2y - z - 1 = 0$.

Answer: .....

b) What is the distance between those two planes?

Answer: .....

Question 8

Find parametric equation of the line which passes through the point $(1,\ 1,\ -1)$ and is orthogonal to the vectors $\mathbf{i}+\mathbf{j}$ and $\mathbf{j}-\mathbf{k}$.

Answer: .....

Question 9

A particle moves with acceleration $\mathbf{a}(t) = (0,\, e^t,\, t)$. Find velocity and position function if the initial data are $\mathbf{v}(0) = (1,\, 0,\, 1),\ \mathbf{r}(0) = (0,\, 1,\, 1)$.

Answer: .....

Question 10

Find the length of the curve given by $\mathbf{r}(t) = (t,\, 2\sin t,\, -2\cos t)$ when $1 \le t \le 5$.

Answer: .....

Question 11

Find the distance between two lines:

$$\frac{x-1}{2} = \frac{y}{1} = \frac{z+1}{1}, \qquad \frac{x}{1} = \frac{y}{-1} = \frac{z-1}{1}.$$

Answer: .....