Spring '05

MATH 331 (L20)

Assignment 3

Due date: Tutorial class Attempt all Problems.

1(i) Find the area of the ||gram spanned by $\vec{A} = (1,1,1)$ and $\vec{B} = (0,1,0)$.

(ii) Find the volume of the ||piped spanned by $\vec{A} = (1,1,1)$, $\vec{B} = (0,1,0)$ and $\vec{C} = (2,0,3)$.

(iii) Find the area of the triangle with vertices $P = (0,0,0)$, $Q = (2,2,2)$ and $R = (0,1,0)$.

2. Find the shortest distance between the two lines:

$$L_1 : X = (1,0,-1) + t(1,-1,1), \quad t \in R$$

$$L_2 : X = (1,-1,0) + s(-1,-1,2), \quad s \in R.$$

3. (i) Find the length of the curve $X(t) = \left(\frac{1}{3}e^{3t}, \frac{1}{3}e^{-3t}, \sqrt{2}t\right)$ from $t = 0$ to $t = \frac{1}{3}$.

(ii) Find the equation of the tangent line to the curve at $t = \frac{1}{3}$.

4 The curve $X(t) = (2t^2, 1-t, 3+t^2)$ hits the plane $3x - 14y + z = 10$.

(i) Find the points of hitting.

(ii) Find the angles between X' and the normal to the plane at these points.