CALCULUS 1260

TAKE HOME TEST 1 due Friday 09/02/2016

Your Name (PRINT IN BLOCK LETTERS):

INSTRUCTIONS

Work all problems. SHOW YOUR WORK. Circle your answers. Each problem is worth 10 points max.

YOU CAN GET HELP ON CONCEPTS INVOLVED BUT NOT ON THE PROBLEMS THEMSELVES.

1. (a) Write a parametric equation of a line through the points (2, 3, 4) and (1, 2, 3).

   (b) Where does this line cross the $yz$-plane?
2. (a) Find the distance from the point $Q = (2, -1, 2)$ to the plane $2x - y + z = 5$

(b) Find the point on this plane which is closest to $Q$. 

3. (a) Find the distance from the point $Q = (0, 1, 2)$ to the line

$$x = 2t + 1, \ y = 2t, \ z = -t$$

(b) Find the point on this line which is closest to $Q$. 
4.  (a) Find the area of the triangle whose vertices are \((-1, -1, -1), (-1, 0, 1)\) and \((1, 0, -1)\).

(b) Find an equation of a plane containing these three points.
5. Find the volume of tetrahedron spanned by vectors $(1, 1, 0), (1, -1, 0)$ and $(1, 0, 1)$. 
6. Show that intervals joining vertices of tetrahedron with centers of gravity of opposite sites intersect at one point.