

Quiz 1 (MTH U341)
(September 25, 2008)

NAME:

Problem 1. Consider the points $P(1, 2, 1)$, $Q(2, 1, 1)$, and $R(1, 3, 2)$.

- (i) (10 pt) Find the components of \vec{PQ} and \vec{PR} ;
- (ii) (15 pt) Find the area of the triangle ΔPQR .

Problem 2.

- (i) (10 pt) Find a parametric equation of the line that passes through the point $(1, 3, 2)$ and that is parallel to the vector $\vec{v} = \langle 3, -1, 1 \rangle$.
- (ii) (10 pt) Is it true that the line intersects the plane $z = 1$? Find the coordinates of the intersection.

Problem 3.

- (i) (10 pt) Find a scalar equation of the plane passing through the point $(2, -2, 2)$ that is orthogonal to the vector $\vec{n} = \langle 3, 2, 1 \rangle$.
- (ii) (10 pt) Is it true that the plane $7x + 2y - z = 0$ is parallel to the plane obtained in (i)? Explain why.
- (iii) (10 pt) Find the coordinates of the intersection points of the plane obtained in (i) with the coordinate axes O_x , O_y , and O_z . Sketch the plane.

Problem 4. Find the limit, if it exists, or show that the limit does not exist:

- (i) (10 pt) $\lim_{(x,y) \rightarrow (-1,2)} (x^2y + x^3 + y^2 + 1)$.
- (ii) (15 pt) $\lim_{(x,y) \rightarrow (0,0)} \frac{x^5y}{2x^3y^3 - y^6}$;