

MATH 251: Practice 4

June 1, 2015

Name: Solutions

1. Write the equation of the plane through the points $(0, 0, 0)$, $(1, 0, 0)$ and $(1, 1, 0)$.

$$\vec{v}_1 = \langle 1, 0, 0 \rangle$$

$$\vec{v}_2 = \langle 1, 1, 0 \rangle$$

$$\vec{n} = \langle 1, 0, 0 \rangle \times \langle 1, 1, 0 \rangle = \langle 0, 0, 1 \rangle$$

$$d = 0.$$

$$\boxed{z = 0}$$

2. Parametrize the intersection of the paraboloid $z = x^2 + y^2$ with the plane $x + y = 1$.

$$x = t$$

$$y = 1 - t$$

$$z = x^2 + y^2 = t^2 + (1 - t)^2$$

$$\vec{r}(t) = \langle t, 1 - t, t^2 + (1 - t)^2 \rangle$$