

Name: SOLUTIONS

Quiz #2 - September 9, 2008

1. Find an equation (in any form) of the plane containing the points $P(1, 1, 1)$, $Q(2, 1, 0)$ and $R(-1, 1, 2)$.

$$\vec{PQ} = (1, 0, -1) \quad \vec{PR} = (-2, 0, 1) \quad \vec{PQ} \times \vec{PR} = (0, 1, 0) = \vec{n}$$

$$\boxed{(x-1, y-1, z-1) \cdot (0, 1, 0) = 0}$$

OR

$$y-1=0$$

$$\boxed{y=1}$$

2. Give the equation of a line through the point $(5, -2, 1)$ and parallel to the line $(x, y, z) = (1+t, 1-t, 3t)$.

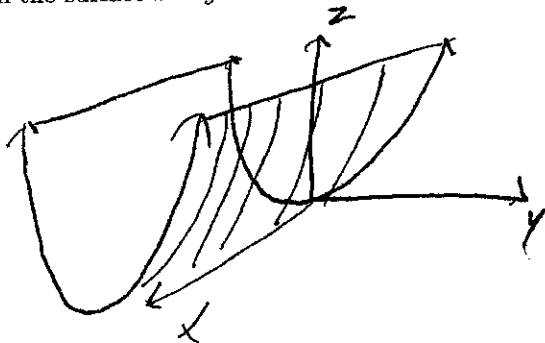
$$(x, y, z) = \cancel{5t-2} \\ (5, -2, 1) + t(1, -1, 3)$$

$$(x, y, z) = (5+t, -2-t, 1+3t)$$

Name: SOLUTIONS

Quiz #2 - September 11, 2008

1. Sketch the surface $z = y^2$ in \mathbb{R}^3 .



2. Let $\vec{r}(t) = (1+t, t^2, t)$. Find the unit tangent vector $\vec{T}(t)$ at the point where $t = 2$.

$$\vec{r}'(t) = (1, 2t, 1) \quad \vec{r}'(2) = \sqrt{5} (1, 4, 1) \quad |\vec{r}'(2)| = \sqrt{18}$$

$$\boxed{\vec{T}(t) = \left(\frac{1}{\sqrt{18}}, \frac{4}{\sqrt{18}}, \frac{1}{\sqrt{18}} \right)}$$