Quiz 2
Math 202 F01

Name: Solutions
02/03/06

1. Give an equation for the plane that contains the parameterized line $\mathbf{m}(t) = (1+2t, -t, 3t)$ and the point $(2, -1, 0)$.

$\vec{m}(t) = (1,0,0) + t(2,-1,3)$

So two directions in the plane are $\vec{a} = (2,-1,3)$ and $\vec{b} = (2,-1,0)-(1,0,0) = (1,-1,0)$

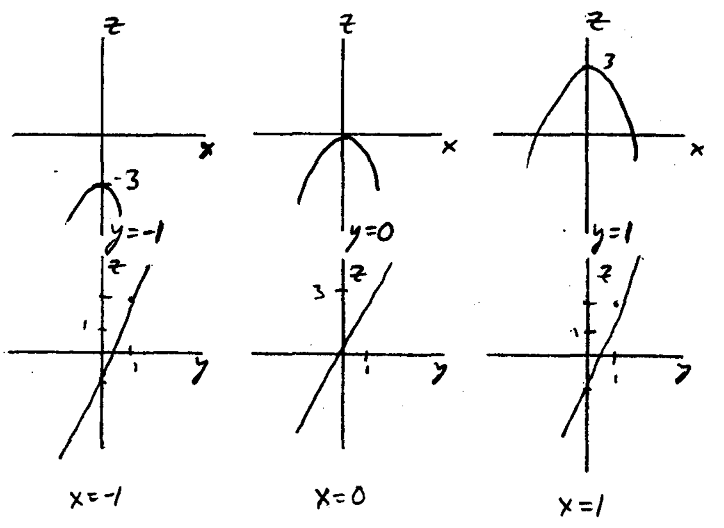
The normal to the plane is $\vec{n} = \vec{a}\times\vec{b} = \begin{vmatrix} \hat{\imath} & \hat{\jmath} & \hat{k} \\ 2 & -1 & 3 \\ 1 & -1 & 0 \end{vmatrix} = (3,3,-1)$,

So the plane is $\vec{n}\cdot(x,y,z) = \vec{n}\cdot(1,0,0)$

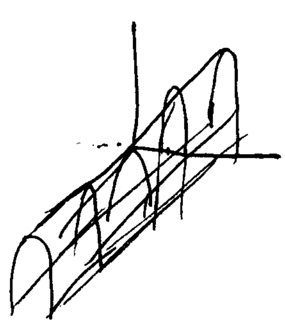
$3x+3y-z = 3$

2. Consider the function $z = f(x,y) = 3y - x^2$.

(a) Sketch graphs of the six cross sections (or traces) of the graph of f where $y = -1, 0, 1$ and $x = -1, 0, 1$.



(b) Use your cross-sections to sketch a graph of f.



parabolic "trough", opening down, that rises in y-direction

(i.e., above y-axis) when $y>0$