

Non linear Analysis Solu's.

1 (a) $\begin{bmatrix} 4 & \alpha \\ 8 & -6 \end{bmatrix}$

$\text{Tr}(A) = -2$

$\det(A) = -24 - 8\alpha = -8(3 + \alpha)$

$\Delta = 4 - 4(-24 - 8\alpha) = 100 + 32\alpha$

$\det(A) > 0 \Rightarrow 3 + \alpha < 0 \Rightarrow \alpha < -3$

$\det(A) = 0 \Rightarrow \alpha = -3$

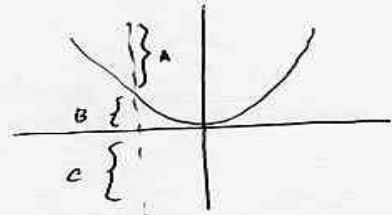
$\det(A) < 0 \Rightarrow \alpha > -3$

$\Delta > 0 \Rightarrow 100 + 32\alpha > 0$

$\alpha > -3.125 \left(-\frac{100}{32} \right)$

$\Delta = 0 \Rightarrow \alpha = -3.125$

$\Delta < 0 \Rightarrow \alpha < -3.125$



Region A: $\alpha < -3.125$

B: $-3.125 < \alpha < -3$

C: $\alpha > -3$

1 (b) $\begin{bmatrix} \alpha & 10 \\ -1 & -1 \end{bmatrix}$

$\text{Tr}(A) = \alpha - 1$

$\det(A) = 10 - \alpha$

$\Delta = \alpha^2 + 8\alpha - 24$

