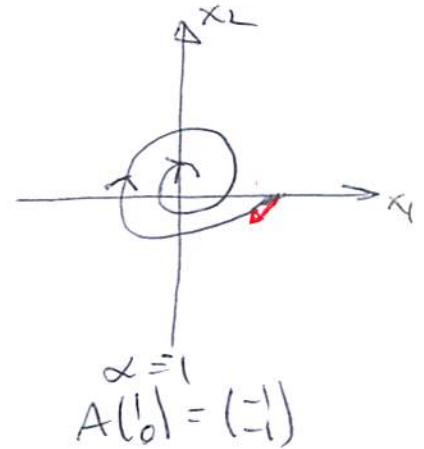
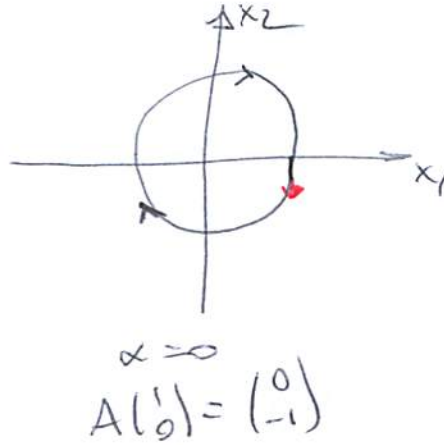
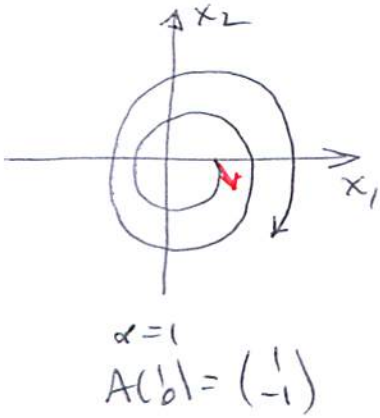
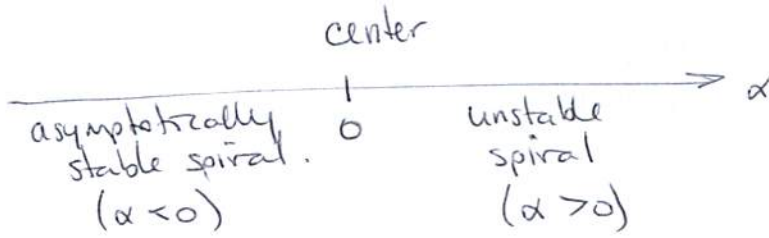


# § 7.6 HW Solutions

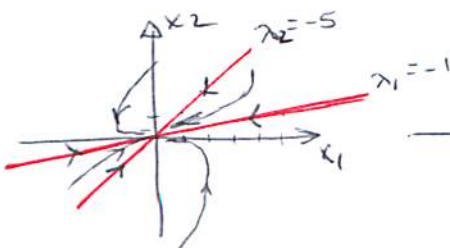
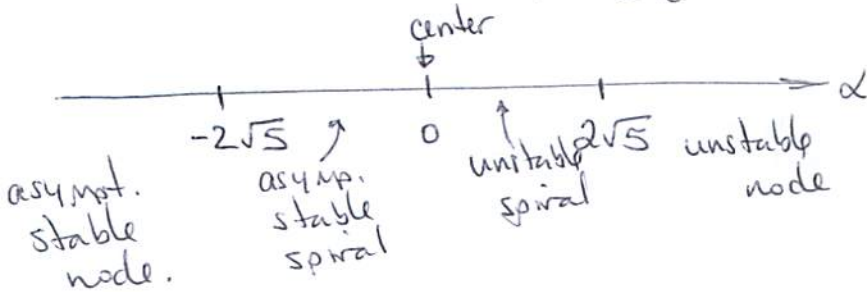
#13.  $A = \begin{pmatrix} \alpha & 1 \\ -1 & \alpha \end{pmatrix}$   $\det(A - \lambda I) = \det \begin{pmatrix} \alpha - \lambda & 1 \\ -1 & \alpha - \lambda \end{pmatrix} = (\alpha - \lambda)^2 + 1 = 0$   
 $(\alpha - \lambda)^2 = -1$

$\alpha - \lambda = \pm i$   
 $\lambda = \alpha \pm i$

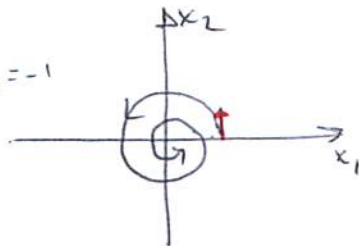


#14.  $A = \begin{pmatrix} 0 & -5 \\ 1 & \alpha \end{pmatrix}$   $\det(A - \lambda I) = \det \begin{pmatrix} -\lambda & -5 \\ 1 & \alpha - \lambda \end{pmatrix} = -\lambda(\alpha - \lambda) + 5 = 0$

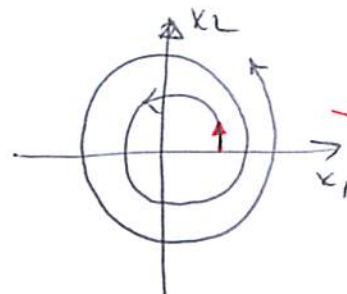
$= \lambda^2 - \alpha\lambda + 5 = 0$   
 $\lambda = \frac{1}{2}(\alpha \pm \sqrt{\alpha^2 - 20})$



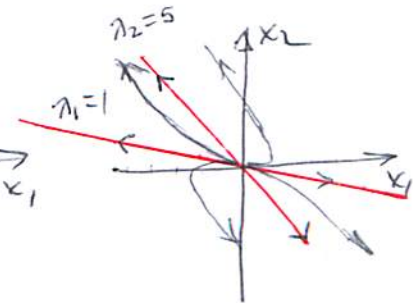
$\alpha = -6$   
 $\vec{v}^{(1)} = \begin{pmatrix} 5 \\ 1 \end{pmatrix}$   
 $\vec{v}^{(2)} = \begin{pmatrix} 1 \\ 1 \end{pmatrix}$



$\alpha = -1$   
 $A \begin{pmatrix} -1 \\ 0 \end{pmatrix} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$



$\alpha = 1$   
 $A \begin{pmatrix} 1 \\ 0 \end{pmatrix} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$



$\alpha = 6$   
 $\vec{v}^{(1)} = \begin{pmatrix} 5 \\ -1 \end{pmatrix}$   
 $\vec{v}^{(2)} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$