

81. The standard form is either

$$\begin{pmatrix} \alpha & \beta & 0 \\ -\beta & \alpha & 0 \\ 0 & 0 & \lambda_3 \end{pmatrix}$$

$$\begin{aligned} \alpha^2 + \beta^2 &< 1 \\ |\lambda_3| &> 1 \end{aligned}$$

or

$$\begin{pmatrix} \lambda_1 & * & 0 \\ 0 & \lambda_2 & 0 \\ 0 & 0 & \lambda_3 \end{pmatrix}$$

$$* \neq 0 \text{ only if } \lambda_1 = \lambda_2$$

The x - y -plane W^s is invariant and the z -axis W^u also.

Apply Cor 2.9. to these subspaces.

Remarks: If two eigenvalues > 1 in abs. value, we can make obvious modifications.

In higher dim. the results are similar. Use Jordan normal forms.

Def 2.11 W^s is the stable subspace of L
 W^u is the unstable — " —