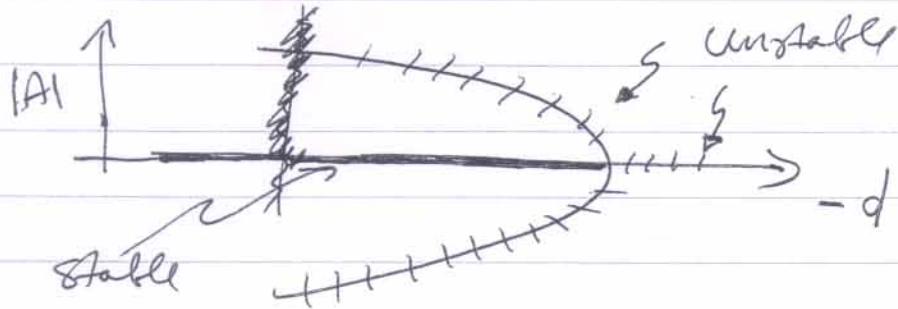


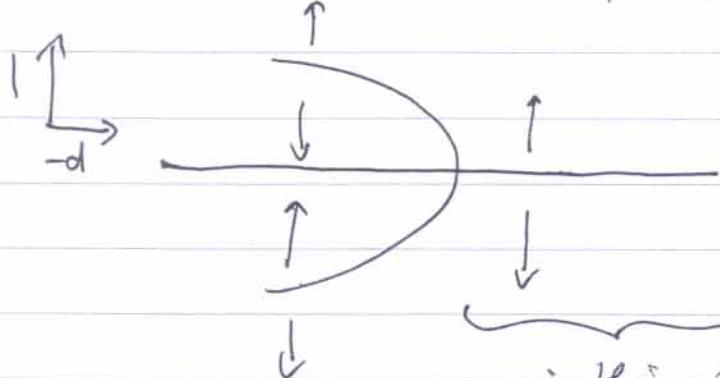
e) The amplitude equation

$$\frac{dA}{dt} = -\alpha A^2 + \frac{E^2 g^2}{6} (A)^2 A$$

describes a subcritical pitch-fork bifurcation



with arrows for flow



in this regime ($\alpha < 0$) any small perturbation diverges to infinity

Side remark: one can show this happens in finite world have to solve

$$\frac{dR}{dt} = -\alpha R^2 + \frac{E^2 g^2}{6} R^3$$

by partial-fraction decomposition

take special care for illustration $\alpha=0$

$$\frac{dR}{dt} = \frac{E^2 g^2}{6} R^3$$