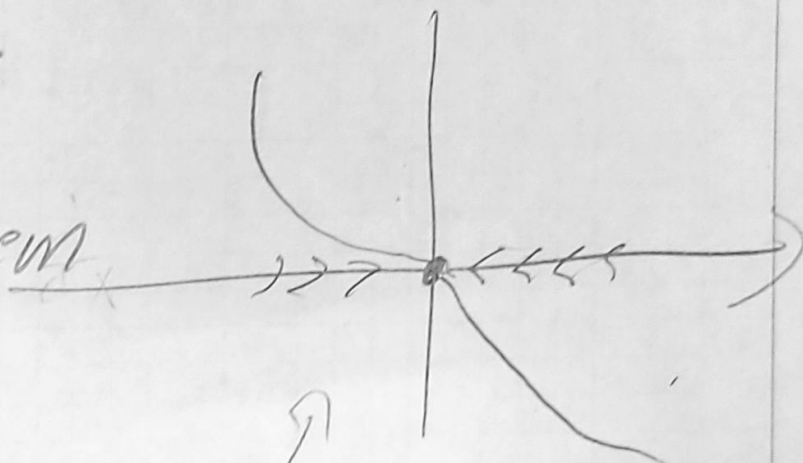


1)

a)  $\dot{x} = -x^3$

@ (0,0) the system  
is GAS



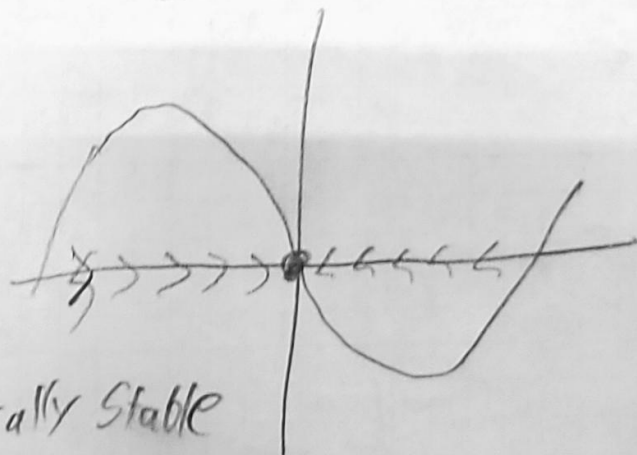
pretty  
obvious  
Explanatio...

can be proven more strictly w/  
La Salle's principle

b)  $\dot{x} = -\sin(x)$

@ (0,0) the system

is locally Asymptotically Stable  
over  $D \in [-\pi, \pi]$



2) If LTI, The system is <sup>at least</sup> marginally stable,

In general,

$$A^T P + P A < 0$$

Globally Asymptotically Stable