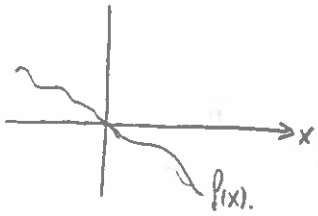
GIVEN $\ddot{x}(t) = f(x(t))$

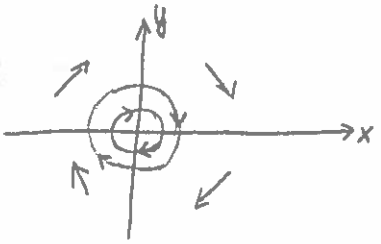
PHASE PORTRAIT NEAR THE EQUILIBRIUM POINT (0,0)

1) $F(x) = \int f(y)\,dy$ HAS A MAX AT $x = 0$

GRAPH OF f



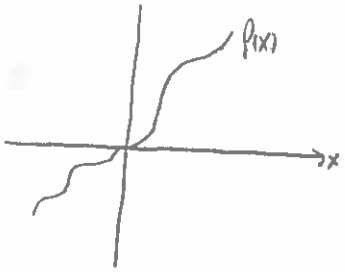
PHASE PORTRAIT



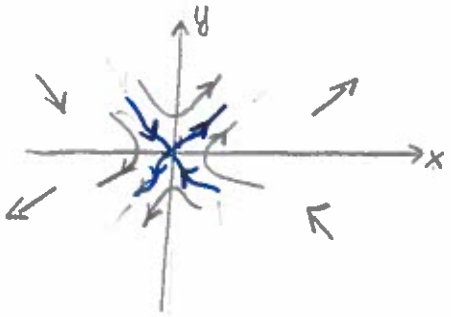
CENTER
~ STABIL

2) $F(x) = \int f(y)\,dy$ HAS A MIN AT $x = 0$

GRAPH OF f

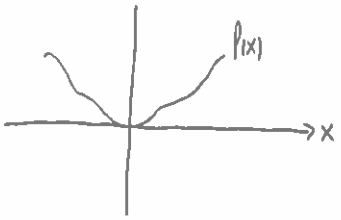


PHASE PORTRAIT

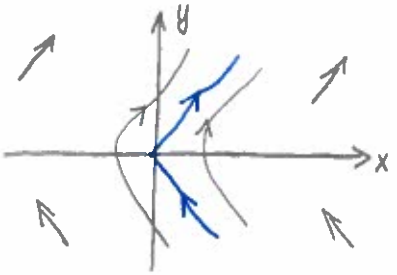


3) $F(x) = \int f(y)\,dy$ HAS AN INFLECTION POINT AT $x = 0$.

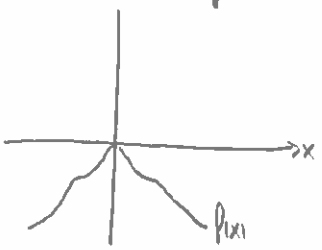
(i) GRAPH OF f



PHASE PORTRAIT



(ii) GRAPH OF f



PHASE PORTRAIT