



$/$  = slope field  
 $-$  = solution curve

$$y(t) = y_0 \text{ (constant)}$$

Definition: a point  $y_0$  is called a critical point (aka equilibrium point) if any of the following equivalent conditions hold:

-  $f(y_0) = 0$

- slope at  $y_0 = 0$

-  $y(t) = y_0$  is a constant solution of the ODE

Proof that  $f(y_0) = 0 \Rightarrow y(t) = y_0$  is soluti.

$$\begin{array}{ccc} \frac{d}{dt} [y(t)] & \text{vs} & f(y(t)) \\ \parallel & & \parallel \\ \frac{d}{dt} (y_0) & & f(y_0) \\ \parallel & & \parallel \\ 0 & & 0 \end{array}$$