$$\dot{x} = f(x,y)$$
$$\dot{y} = g(x,y)$$

(x_0,y_0) ... EQUILIBRIUM POINT

$I_{(x_0,y_0)} = I_\Gamma$ (Γ SMOOTH SIMPLE ☞ ONLY EP SURROUNDED (x_0,y_0))

$\Downarrow$ $(x_i,y_i) \in \operatorname{int}\Gamma \quad i = 1,\dots,n$ (EQUILIBRIUM POINTS)

$$I_\Gamma = \sum_{i=1}^{n} I_{(x_i,y_i)}$$

GENERAL

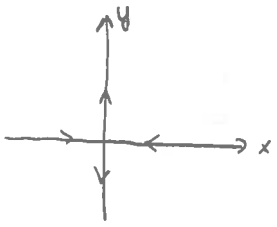
$\uparrow \rightsquigarrow \rightarrow \rightsquigarrow \downarrow \quad = -\pi$

$\downarrow \rightsquigarrow \leftarrow \rightsquigarrow \uparrow \quad = -\pi$

$\uparrow \rightsquigarrow \leftarrow \rightsquigarrow \downarrow \quad = \pi$

$\downarrow \rightsquigarrow \rightarrow \rightsquigarrow \uparrow \quad = \pi$

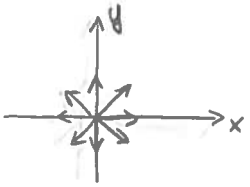
·) SADDLE



$\uparrow \rightsquigarrow \rightarrow \rightsquigarrow \downarrow \rightsquigarrow \leftarrow \; = -2\pi$

$I_{(0,0)} = -1.$

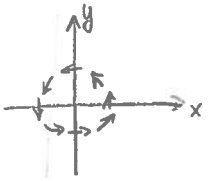
·) NODE



$\uparrow \rightsquigarrow \leftarrow \rightsquigarrow \downarrow \rightsquigarrow \rightarrow \; = 2\pi$

$I_{(0,0)} = 1$

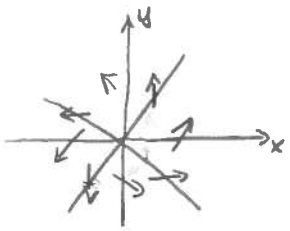
·) CENTRE



$\uparrow \rightsquigarrow \leftarrow \rightsquigarrow \downarrow \rightsquigarrow \rightarrow \; = 2\pi$

$I_{(0,0)} = 1.$

·) SPIRAL

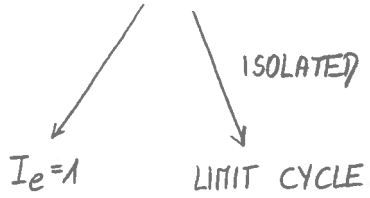


$\uparrow \rightsquigarrow \leftarrow \rightsquigarrow \downarrow \rightsquigarrow \rightarrow \; = 2\pi$

$I_{(0,0)} = 1$

$$\dot{x} = f(x,y)$$
$$\dot{y} = g(x,y)$$

PERIODIC SOLUTIONS $\triangleq$ CLOSED PHASE PATHS C



C SIMPLE CLOSED CURVE