6) $$\begin{cases} \dot{x}_1 = \alpha x_1 - x_2 + x_1(x_1^2 + x_2^2) \\ \dot{x}_2 = x_1 + \alpha x_2 + x_2(x_1^2 + x_2^2) \end{cases}$$

$$\begin{cases} \dot{r} = r(\alpha + r^2) \\ \dot{\varphi} = 1 \end{cases}$$

$r_0 = 0, \quad r_* = \sqrt{-\alpha}$

$\left(r(\alpha + r^2)\right)'_r = \alpha + 3r^2$

$\alpha < 0$