

(3) For $(-1, 0)$, the eigenvalues of

$$J = \begin{bmatrix} 1 & -2 \\ 0 & 2 \end{bmatrix}$$

are -1 and 2 .

Since one is negative and the other is positive, we have that $(-1, 0)$ is a saddle point.

For $(0, 0)$, $J = I$ so the eigenvalues are 1 and 1 . Since $\mu_1 = \mu_2 > 1 \implies (0, 0)$ is an unstable node from Table 9.1.1(a).