(a) There are four possibilities to check for critical points. The first is when $2 + x = 0$ and $4 - x$, and this pair of equations has no solutions. The second is $2 + x = 0$ and $y + x = 0$, which gives $(-2, 2)$. The third is $y - x = 0$ and $4 - x = 0$, which gives $(4, 4)$. The last one is $y - x = 0$ and $y + x = 0$, which gives $(0, 0)$.

(b) (Notice that $(4, 4)$ was listed in part (a).) To find the corresponding linear system, we compute the partial derivatives

$$
\frac{\partial}{\partial x}((2 + x)(y - x)) = \frac{\partial}{\partial x}(2y - 2x + xy - x^2) = -2 + y - 2x,
$$

$$
\frac{\partial}{\partial x}((4 - x)(y + x)) = \frac{\partial}{\partial x}(4y + 4x - xy - x^2) = 4 - y - 2x,
$$

$$
\frac{\partial}{\partial y}((2 + x)(y - x)) = 2 + x,
$$

$$
\frac{\partial}{\partial y}((4 - x)(y + x)) = 4 - x.
$$

Then the linear system is

$$
x' = \begin{pmatrix} -6 & -8 \\ 6 & 0 \end{pmatrix} x.
$$

(c) To determine the type and stability, we compute the eigenvalues of the matrix from part (b). We get the eigenvalues from the equation

$$
0 = \det \begin{pmatrix} -6 - r & -8 \\ 6 & -r \end{pmatrix} = (-6 - r)(-r) - (-8)6 = r^2 + 6r + 48,
$$

so the eigenvalues are

$$
\frac{-6 \pm \sqrt{36 - 4(48)}}{2} = -3 \pm i\sqrt{39}.
$$

They are complex with negative real part, so it is an asymptotically stable spiral point.