Ok so the general jacobian matrix of the system is given by

$$J = \begin{bmatrix} 1+10h+hy_n & -10h+hx_n \\ 30h+2hx_n & 1-20h \end{bmatrix}$$

Now if we evaluate this matrix at the fixed point, then $x_n = 0$ and $y_n = 0$ giving us

$$J_{(0,0)} = \begin{bmatrix} 1+10h & -10h \\ 30h & 1-20h \end{bmatrix}$$

We need to find the eigenvalues of this matrix which are given by solving Determinant$(J_{0,0} - \lambda I) = 0$

This gives us

$$(1+10h-\lambda)(1-20h-\lambda) + 300h^2 = 0$$

and expanding this out and solving for λ we get two solutions

1. $\lambda_1 = -5i\sqrt{3}h - 5h + 1$
2. $\lambda_2 = 5i\sqrt{3}h - 5h + 1$

There is a theorem that states a fixed point is stable if and only if the real parts of the eigenvalues are negative. The real parts of both of the eigenvalues is given by $-5h + 1$

So solving $-5h + 1 < 0$ and keeping in mind that $h > 0$ by assumption we get that $h > \dfrac{1}{5}$. So the system is stable provided $h > \dfrac{1}{5}$ and unstable if $0 < h < \dfrac{1}{5}$