NAME: **SECTION:**

Quiz 7: Suppose two populations x and y evolve according to the equation

$$\frac{d}{dt}\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} x(5-x-y) \\ y(7-2x-y) \end{pmatrix}$$

1. (3 pts) Find the *coexistence* equilibrium point **a** where both populations are nonzero.

2. (3 pts) What linear system best approximates the differential equation near the equilibrium point **a**?

3. (3 pts) Is the euilibrium point **a** stable, unstable, or semistable?