**Example.** Consider the predator-prey model for the populations $x(t)$ and $y(t)$:

\[ x' = x (1 - y), \quad y' = -y (2 - x) \]

(a) Find all critical points $(x_0, y_0)$ of the system.

(b) Classify the local behavior of the solution about each critical point, and sketch the phase portrait of the system.
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