Pset 10 Part I

Problem 1: Find the critical points of the non-linear autonomous system

$$x' = 1 - x + y$$
$$y' = y + 2x^2$$

Problem 2: Write as equivalent first-order system and find the critical points:

$$x'' - x' + 1 - x^2 = 0$$

Problem 3: In general, what can you say about the relation between the trajectories and the critical points of the system on the left below, and those of the two systems on the right?

$$x' = f(x, y)$$
$$y' = g(x, y)$$

$$a)\ x' = -f(x, y)$$
$$y' = -g(x, y)$$

$$b)\ x' = g(x, y)$$
$$y' = -f(x, y)$$

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