

Name \_\_\_\_\_

Section \_\_\_\_\_

$$\frac{dy}{dt} = y^2(1 - y^2)$$

- (2 pts) What order is the differential equation above? Is it linear or nonlinear?
- (3 pts) In the  $y$ - $t$  plane below, sketch the slope field and several solutions to the differential equation. Be sure to include any constant solutions to the diffeq. In the  $y'$ - $y$  plane below, sketch the derivative  $y'$  as a function of  $y$ .
- (3 pts) What are the equilibrium points? Classify them according to their stability.

(3 pts) Determine the asymptotic behavior of solutions for any initial condition \_\_\_\_\_.

$$\lim_{t \rightarrow \infty} y(t) = \left\{ \begin{array}{l} \\ \\ \end{array} \right.$$

