

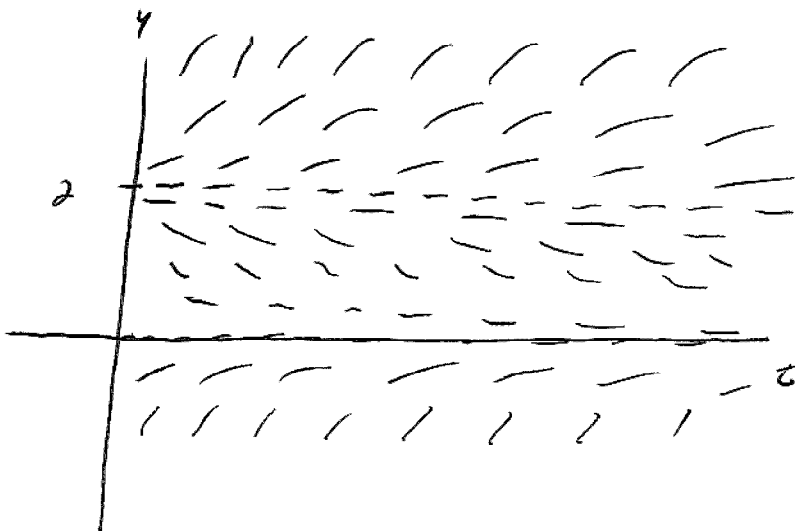
Name: SOLUTIONS

Quiz #1 - January 14, 2004

1. Consider:

$$y' = y(y - 2).$$

Draw a direction field for this differential equation. Based on the direction field, determine the behavior of y as $t \rightarrow \infty$. If this behavior depends on the initial value of y at $t = 0$, describe this dependency.



If $y(0) > 2$ then

$$y \rightarrow \infty \text{ as } t \rightarrow \infty$$

If $0 < y(0) < 2$ then

$$y \rightarrow 0 \text{ as } t \rightarrow \infty$$

If $y(0) = 2$ then

$$y = 2$$

2. Solve for $y(t)$ given:

$$y' = y - 5, \quad y(0) = 3.$$

$$\frac{y'}{y-5} = 1$$

$$\ln|y-5| = t + C$$

$$y-5 = Ce^t$$

$$y = Ce^t + 5$$

$$3 = C + 5$$

$$y = -2e^t + 5$$