Direction fields

Sketch the solution curve corresponding to each IVP. Also identify the limiting behavior of the solution.
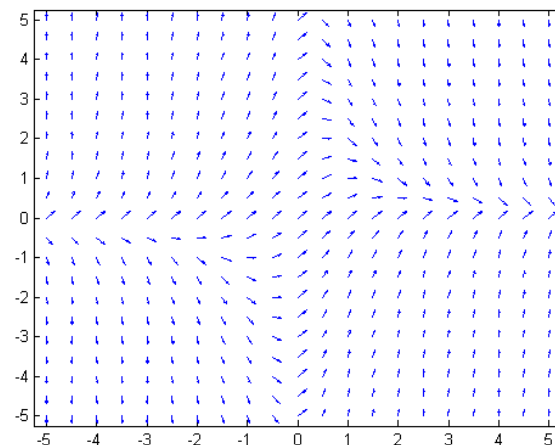
1. $\dfrac{dy}{dt} = 1 - ty$

   (a) $y(0) = 0$

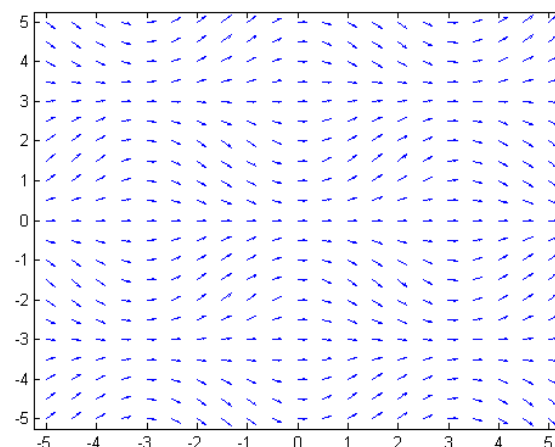   (b) $y(2) = 2$

   (c) $y(-1) = 0$

   (d) $y(0) = -4$

2. $\dfrac{dy}{dt} = \sin(t)\sin(y)$

   (a) $y(0) = 1$

   (b) $y(3) = 3$

   (c) $y(1) = 0$

   (d) $y(0) = -\dfrac{5}{2}$

3. $\dfrac{dy}{dt} = 1 - \dfrac{y}{t}$

(a) $y(-1/2) = 2$

(b) $y(3/2) = 0$