Direction Field For $y' = 0.2xy$

Direction field for $y' = 0.2xy$
Direction Field and Solution for $y' = 0.2xy$

The solution curve with initial condition $y(0) = 1$ is shown.
Solution Curves for $y' = 0.2xy$

Direction field for $y' = 0.2xy$

Several solution curves are shown.
Solution Curves for $y' = \sin y$

Direction field for $y' = \sin y$

Several solution curves are shown. Note that there are critical points at $y = \pm n\pi$. 
Direction Field For $y' = y$

Direction field for $y' = y$ showing solutions with initial conditions $y(0) = 3$ and $y(1) = -2$.

The solutions have the form $y = ce^x$
Direction Field for $y' + 2xy^2 = 0$

Direction field for $y' + 2xy^2 = 0$ showing several solutions.

The solutions have the form $y = 1/(x^2 + c)$ and there is the singular solution $y = 0$. 
Direction Field For \( y' = (y - 1)^2 \)

Direction field for \( y' = (y - 1)^2 \) showing several solutions.

The solutions have the form \( y = 1 - \frac{1}{x+c} \) and there is the singular solution \( y = 1 \).

Vertical asymptotes cannot be predicted qualitatively.
Direction Field for $P' = P(a - bP)$

Direction field for $P' = P(a - bP)$ showing several solutions.

The parameter values are $a = 2$, $b = 1$.

The critical points are $P = 0$ and $P = a/b = 2$. 

Phase line for the population DE \( dP/dt = P(a - bP) \).