Section 2.1 (Continued)

Example: $\frac{dy}{dx} = y^2 - y^3$. ← $f(y)$

$f(y)$ ↑ dependent variable y.

autonomous differential equation

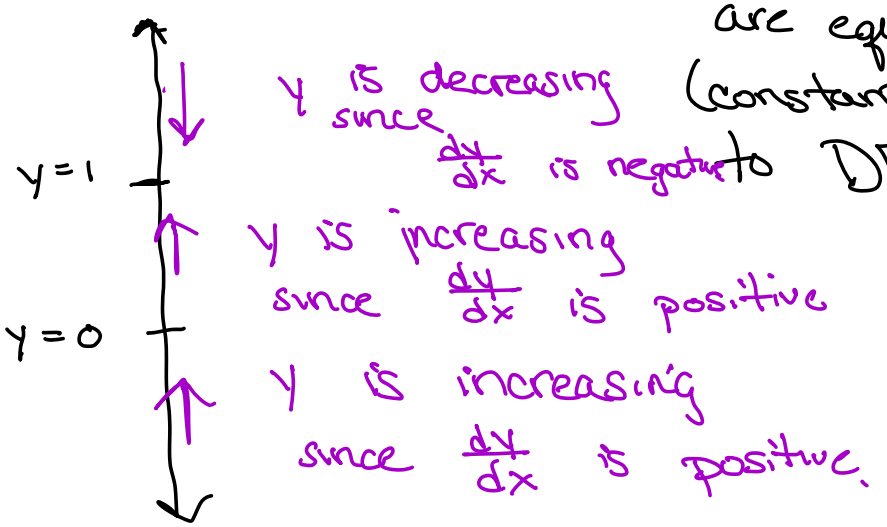
$$0 = y^2 - y^3 = y^2(1-y)$$

$y = 0$, $y = 1$

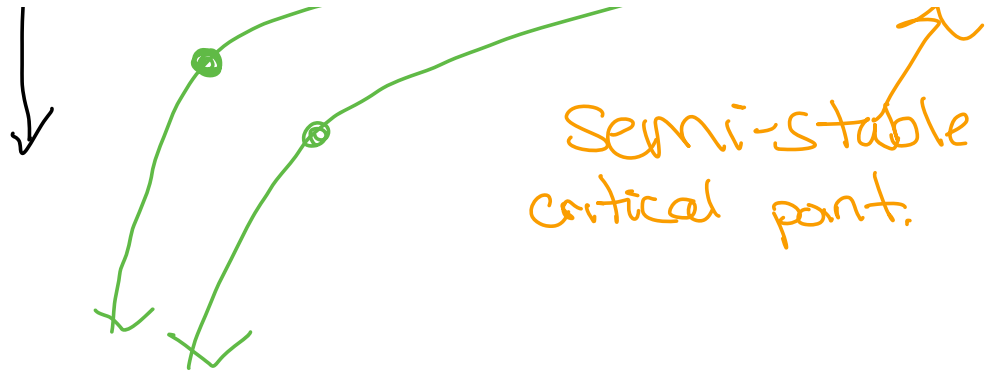
$y(x) \equiv 0$ ↓ $y(x) = 1$ ↓

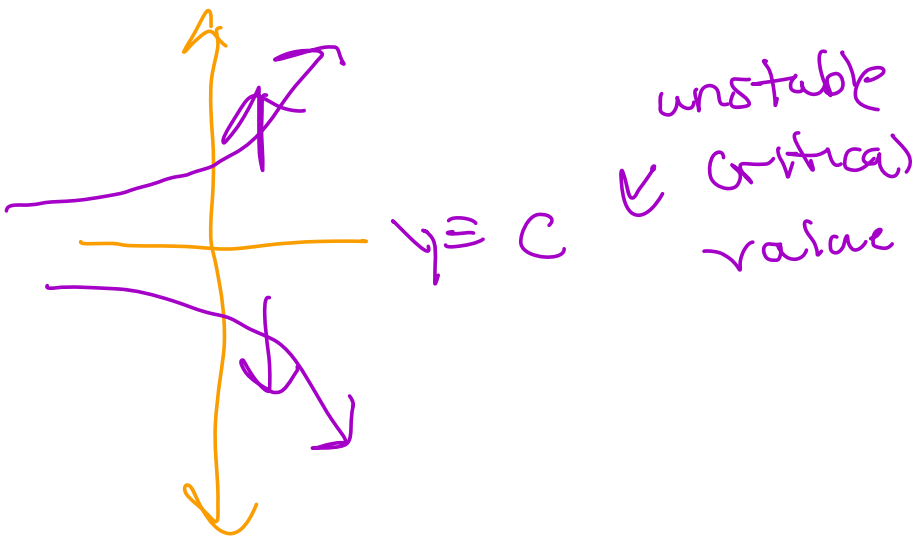
$y \equiv 0$ and $y \equiv 1$ are equilibrium (constant) solution to DE

Phase Portrait



Typical Solution Curve





$$\frac{dy}{dx} = y^2 + 5y + 4 = (y+4)(y+1)$$