Solution Curves Without a Solution

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September 2, 2020

- The function f in the normal form is called the slope function or rate function

$$\frac{dy}{dx} = f(x, y)$$

- Lineal Element $-$ An individual slope at a certain point

- Direction Field (Slope Field) $-$ The collection of all lineal elements

- Autonomous First-Order Differential Equation:

$$\frac{dy}{dx} = f(y)$$

- Critical Points $-$ Also called equilibrium or stationary points, they are points, c, which, when plugged into a function, yield:

$$f(c) = 0$$

- Equilibrium Solution $-$ If c is a critical point, then $y(x) = c$ is a constant solution of the autonomous differential equation. Equilibria are the only constant solutions

- One-Dimensional Phase Portrait $-$ Simply called a phase portrait, it shows the intervals where a function is increasing and decreasing (essentially a sign chart). The line that the intervals are graphed on is named the phase line