**Explicit Function** $y = x^2 + x = 1$

The dependent variable $y$ is separate from the independent variable $x$, making this function explicitly written.

**Implicit Function** $x^2 + y^2 = 1$

The dependent variable $y$ is not separate from the independent variable $x$, making this function implicitly written.

**Implicit Differentiation** Given an implicitly written function, $2x^3 + 2y^3 = 9xy$. We can find the derivative by doing the following

$$\begin{aligned} 2x^3 + 2y^3 &= 9xy \\ \frac{d}{dx}(2x^3 + 2^3) &= \frac{d}{dx}(9xy) \\ 6x^2 + 6y^2\frac{dy}{dx} &= (9)(y) + (9x)\frac{dy}{dx} \\ 6x^2 = 9y &= 9x\frac{dy}{dx} - 6y^2\frac{dy}{dx} \\ 6x^2 = 9y &= (9x - 6y^2)\frac{dy}{dx} \\ &= \frac{6x^2 - 9y}{9x - 6y^2} = \frac{dy}{dx} \end{aligned}$$