

3.7 Implicit Differentiation

Implicit vs. Explicit

$$y + x^2 - x = 0$$

$$y = -x^2 + x$$

Oct 1-4:59 PM

Find $\frac{dy}{dx}$ $x^2 + y^2 = 25$

$$y = -x^2 + x$$

$$y + x^2 - x = 0$$

Oct 1-5:02 PM

Process for Implicit Differentiation

1. Differentiate both sides of the equation with respect to x .

2. Collect the terms with $\frac{dy}{dx}$ on one side of the equation

3. Factor out $\frac{dy}{dx}$

4. Solve for $\frac{dy}{dx}$

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Find $\frac{dy}{dx}$ $y^3 + y^2 - 5y - x^2 = -4$

Oct 4-3:35 PM

Find the slope of the circle at the point (3,4)

$$x^2 + y^2 = 25$$

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higher order derivatives

Find the second derivative of y with respect to x

$$x^2 + y^2 = 25$$

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$$2x^3 - 3y^2 = 8$$

$$xy^2 + x^2y - 4x = 10$$

Oct 4-3:38 PM

$$(xy)^2 + x^2y^2 - (4x)^3 = 15$$

Sep 18-8:18 AM