

# Calculus AB

## 2-5

### Implicit Differentiation

Nov 12-9:02 AM

Find  $\frac{dy}{dx}$ .

Explicit Differentiation -

$$3x + 2y = 7$$

$$2y = -3x + 7$$

$$y = -\frac{3}{2}x + \frac{7}{2}$$

$$\frac{dy}{dx} = -\frac{3}{2}$$

Implicit Differentiation -

$$3x + 2y = 7$$

$$3 + 2\frac{dy}{dx} = 0$$

$$2\frac{dy}{dx} = -3$$

$$\frac{dy}{dx} = -\frac{3}{2}$$

Nov 12-9:06 AM

Find  $dy/dx$  by implicit differentiation.

$$1) x^2 + y^2 = 36$$

$$2x + 2y \frac{dy}{dx} = 0$$

$$2y \frac{dy}{dx} = -2x$$

$$\frac{dy}{dx} = \frac{-2x}{2y} = -\frac{x}{y}$$

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Find  $\frac{dy}{dx}$

$$9) x^3 - 3x^2y + 2xy^2 = 12$$

$$3x^2 - 6xy - 3x^2 \frac{dy}{dx} + 2y^2 + 2x(2y \frac{dy}{dx}) = 0$$

$$-3x^2 \frac{dy}{dx} + 4xy \frac{dy}{dx} = 6xy - 3x^2 - 2y^2$$

$$(-3x^2 + 4xy) \frac{dy}{dx} = 6xy - 3x^2 - 2y^2$$

$$\frac{dy}{dx} = \frac{6xy - 3x^2 - 2y^2}{-3x^2 + 4xy}$$

Nov 12-9:04 AM

$$21) \quad xy = 4 \quad (-4, 1)$$

$$1y + x \frac{dy}{dx} = 0$$

$$x \frac{dy}{dx} = -y$$

$$\frac{dy}{dx} = -\frac{y}{x} \Big|_{(-4, 1)} = \frac{1}{4}$$

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2-16 even

22-28 even

pg 135

92-97 all

104-108 all

Nov 6-11:38 AM