

AP Calculus AB Sec 2.5 Implicit Differentiation

What are Implicit/Explicit Functions

Implicit - can't easily solve for x or y

Explicit - can solve for y or x

Goal to take derivative
which means find y'

ex. $y^3 + y^2 - 5y - x^2 = -4$

$$3y^2 \cdot y' + 2y \cdot y' - 5y' - 2x = 0$$

$$y'(3y^2 + 2y - 5) = 2x$$

$$y' = \frac{2x}{3y^2 + 2y - 5}$$

Oct 5-7:19 AM

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

Goal: find y'

$$[x^2y' + 2xy] + [y^2 \cdot 1 + 2yy' \cdot x] = 0$$

$$x^2y' + 2xy + y^2 + 2xyy' = 0$$

$$y'(x^2 + 2xy) = -2xy - y^2$$

$$y' = \frac{-2xy - y^2}{x^2 + 2xy}$$

Oct 7-7:50 AM

Classwork/Homework - do the following problems.

FIND $\frac{dy}{dx}$ FOR EACH OF THE FOLLOWING.

506. $x^2 - y^2 = 5$

509. $x = \tan y$

507. $1 - xy = x - y$

510. $x^3 - xy + y^3 = 1$

508. $y^2 = x^3$

511. $9x^2 + 25y^2 = 225$

FIND $\frac{d^2y}{dx^2}$ IN TERMS OF x AND y FOR THE FOLLOWING THREE PROBLEMS.

514. $xy + y^2 = 1$

515. $y^2 = x^2 + 2x$

516. $x^2 + xy = 5$

Sep 23-9:06 AM