



# Calculus 1 Workbook

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Implicit differentiation

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MATH

## IMPLICIT DIFFERENTIATION

- 1. Use implicit differentiation to find  $dy/dx$  at (3,4) for the equation.

$$4x^3 - 3xy^2 + y^3 = 28$$

- 2. Use implicit differentiation to find  $dy/dx$  for the equation.

$$5x^3 + xy^2 = 4x^3y^3$$

- 3. Use implicit differentiation to find  $dy/dx$  for the equation.

$$3x^2 = (3xy - 1)^2$$



## EQUATION OF THE TANGENT LINE WITH IMPLICIT DIFFERENTIATION

- 1. Use implicit differentiation to find the equation of the tangent line to  $5y^2 = 2x^3 - 5y + 6$  at  $(3,3)$ .
  
- 2. Use implicit differentiation to find the equation of the tangent line to  $5x^3 = -3xy + 4$  at  $(2, -6)$ .
  
- 3. Use implicit differentiation to find the equation of the tangent line to  $4y^2 + 8 = 3x^2$  at  $(6, -5)$ .



## SECOND DERIVATIVES WITH IMPLICIT DIFFERENTIATION

- 1. Use implicit differentiation to find  $d^2y/dx^2$ .

$$2x^3 = 2y^2 + 4$$

- 2. Use implicit differentiation to find  $d^2y/dx^2$ .

$$4x^2 = 2y^3 + 4y - 2$$

- 3. Use implicit differentiation to find  $d^2y/dx^2$  at (0,3).

$$3x^2 + 3y^2 = 27$$



