

Watch. Practice. Understand. | Lesson 286

Calculus 3 5 Implicit Differentiation Part I

Watch the matching video: https://www.youtube.com/watch?v=Ik6o_0xehLU

Practice focus: Implicit differentiation

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 For $x^2 + y^2 = 25$, find dy/dx .

02 Find the tangent line to $x^2 + y^2 = 25$ at $(3,4)$.

03 For $xy = 6$, find dy/dx .

04 For $x^3 + y^3 = 6xy$, find dy/dx .

Worked answers | Lesson 286

Calculus 3 5 Implicit Differentiation Part I

Watch the matching video: https://www.youtube.com/watch?v=Ik6o_0xehLU

Practice focus: Implicit differentiation

Original extra practice matched to the listed lesson topic.

01 For $x^2 + y^2 = 25$, find dy/dx .

$2x + 2y y' = 0$, so $y' = -x/y$ where $y \neq 0$.

02 Find the tangent line to $x^2 + y^2 = 25$ at $(3, 4)$.

Slope $-3/4$. Tangent: $y - 4 = -(3/4)(x - 3)$.

03 For $xy = 6$, find dy/dx .

Product rule: $y + xy' = 0$, so $y' = -y/x$, $x \neq 0$.

04 For $x^3 + y^3 = 6xy$, find dy/dx .

$3x^2 + 3y^2 y' = 6y + 6xy'$. Thus $y' = (6y - 3x^2)/(3y^2 - 6x)$ where denominator is nonzero.