

$$\lim_{x \rightarrow \infty} \int_2^3 \frac{1}{dx} dy$$

IMPLICIT DIFFERENTIATION

Prepared by Ingrid Stewart, Ph.D., College of Southern Nevada
Please Send Questions and Comments to ingrid.stewart@csn.edu. Thank you!

Problem 1:

Find $\frac{dy}{dx}$ given $x^2 + y^2 = 9$.

Problem 2:

Find $\frac{dy}{dx}$ given $y^4 + 3y - 4x^3 = 5x + 1$.

Problem 3:

Find $\frac{dy}{dx}$ given $3x^4 - xy = -4y^3$.

Problem 4:

Find $\frac{dy}{dx}$ given $y = x^2 \sin y$.

Problem 5:

Find $\frac{dy}{dx}$ given $x = \sin xy$.

Problem 6:

Find $\frac{dy}{dx}$ given $y^2 + 1 = x^2 \sec y$.

Problem 7:

Find $\frac{dy}{dx}$ given $xy = \tan y$.

Problem 8:

Find $\frac{dy}{dx}$ given $x = \cos y$.

Problem 9:

Find $\frac{dy}{dx}$ given $3x - y^3 = 11x^4$ and evaluate the derivative at the point $(1, -2)$.

Problem 10:

Find the *Second Derivative* of $y^2 - 4x^2 = 5$.


SOLUTIONS

You can find detailed solutions below the link for this problem set!

1. $\frac{dy}{dx} = -\frac{x}{y}$	2. $\frac{dy}{dx} = \frac{5 + 12x^2}{4y^3 + 3}$
3. $\frac{dy}{dx} = \frac{-12x^3 + y}{12y^2 - x}$	4. $\frac{dy}{dx} = \frac{2x \sin y}{1 - x^2 \cos y}$
5. $\frac{dy}{dx} = \frac{1 - y(\cos xy)}{x(\cos xy)}$	6. $\frac{dy}{dx} = \frac{2x \sec y}{2y - x^2 \sec y \tan y}$
7. $\frac{dy}{dx} = \frac{-y}{x - \sec^2 y}$	8. $\frac{dy}{dx} = \frac{-1}{\sin y}$
9. $\frac{dy}{dx} = -\frac{44x^3 - 3}{3y^2}$, $\frac{dy}{dx} = \frac{-41}{12}$	10. $\frac{d^2 y}{dx^2} = \frac{4y^2 - 16x^2}{y^3}$