

Lesson 561 Differential Equations Basics

dx = the differential of x

dy = the differential of y

Examples

For each problem, find the differential dy .

1) $y = -x^3 - 2$

2) $y = -\frac{3}{x}$

3) $y = -x^3 - 2$

4) $y = \frac{2}{x}$

Find the general solution of each differential equation.

1) $\frac{dy}{dx} = 2x + 2$

2) $f'(x) = -2x + 1$

3) $\frac{dy}{dx} = -\frac{1}{x^2}$

4) $\frac{dy}{dx} = \frac{1}{(x+3)^2}$

In Exercises 1–10, solve the differential equation.

1. $\frac{dy}{dx} = x + 2$

2. $\frac{dy}{dx} = 4 - x$

3. $\frac{dy}{dx} = y + 2$

4. $\frac{dy}{dx} = 4 - y$

5. $y' = \frac{5x}{y}$

6. $y' = \frac{\sqrt{x}}{3y}$

7. $y' = \sqrt{x}y$

8. $y' = x(1 + y)$

9. $(1 + x^2)y' - 2xy = 0$

10. $xy + y' = 100x$