

Lesson 563 Differential Equations Separation of variables

Examples

Find the general solution of each differential equation.

$$1) \frac{dy}{dx} = e^{x-y}$$

$$2) \frac{dy}{dx} = \frac{1}{\sec^2 y}$$

$$3) \frac{dy}{dx} = xe^y$$

$$4) \frac{dy}{dx} = \frac{2x}{e^{2y}}$$

$$5) \frac{dy}{dx} = 2y - 1$$

$$6) \frac{dy}{dx} = 2yx + yx^2$$

In Exercises 43–54, find the general solution of the differential equation.

43. $\frac{dy}{dx} = \frac{x}{y}$

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

45. $\frac{dr}{ds} = 0.05r$

46. $\frac{dr}{ds} = 0.05s$

47. $(2 + x)y' = 3y$

48. $xy' = y$

49. $yy' = \sin x$

50. $yy' = 6 \cos(\pi x)$

51. $\sqrt{1 - 4x^2}y' = x$

52. $\sqrt{x^2 - 9}y' = 5x$

53. $y \ln x - xy' = 0$

54. $4yy' - 3e^x = 0$