

Key Problems

Problem 1.

Solve the differential equations:

a) $y' = 3t^2 + 2$

b) $ty' = 1$

c) $y' = t\sqrt{t^2 + 1}$

Problem 2.

Solve the differential equations:

a) $y' = 5y$

b) $y' = y^2t$

c) $y' = 5y(1 - y/10)$

Problem 3.

Solve the differential equations:

a) $y' + 3y = 6$

b) $y' - 2ty = 4t$

c) $y' + 2y = e^t$

Problems from the Workbook and Differential Equations

Workbook [W] 10.1 - 10.12, 10.17 - 10.18 (full solutions in the workbook)

Differential equations [DE] 1.1 - 1.19 (full solutions on the web page)

Answers to Key Problems

Problem 1.

a) $y = t^3 + 2t + C$

b) $y = \ln |t| + C$

c) $y = \frac{1}{3}(t^2 + 1)\sqrt{t^2 + 1} + C$

Problem 2.

a) $y = Ke^{5t}$

b) $y = -2/(t^2 + 2C)$

c) $y = 10 \cdot Ke^{5t}/(1 + Ke^{5t})$

Problem 3.

a) $y = 2 + Ce^{-3t}$

b) $y = -2 + Ce^{t^2}$

c) $y = \frac{1}{3}e^t + Ce^{-2t}$