

Problem Set 24: Separable Differential Equations

Key skills: Separable Differential Equations.

Practice Problems

Solve the following separable initial value problems.

$$a) \quad \frac{df}{dx} = f \quad f(0) = 50$$

$$b) \quad \frac{df}{dx} = \frac{3\sqrt[3]{f}}{2} \quad f(0) = 0$$

$$c) \quad \frac{df}{dx} = \frac{2}{f} \quad f(2) = 3$$

$$d) \quad \frac{df}{dx} = x^2 f^2 \quad f(0) = 7$$

$$e) \quad \frac{df}{dx} = \frac{1}{xf} \quad f(1) = 4$$

Answers

a) $f(x) = 50e^x$

b) $f(x) = \sqrt{x^3}$

c) $f(x) = \sqrt{4x + 1}$

d) $f(x) = \frac{-3}{x^3 - \frac{3}{7}}$

e) $f(x) = \sqrt{2 \ln |x| + 16}$