

Solving Separable Equations

Separate variables, integrate both sides, and give an implicit general solution with one C and every equilibrium solution.
Interpret nonconstant branches on connected intervals in the original domain and where division by the y-factor is valid.

1.

$$\frac{dy}{dx} = \frac{-1 \cdot \cos(3 \cdot x + 1)}{y^2}$$

Implicit solution and equilibria: _____

2.

$$\frac{dy}{dx} = -9 \cdot x \cdot y$$

Implicit solution and equilibria: _____

3.

$$\frac{dy}{dx} = -7 \cdot e^{-2 \cdot x} \cdot y^2$$

Implicit solution and equilibria: _____

4.

$$\frac{dy}{dx} = \frac{-5 \cdot x^3}{y}$$

Implicit solution and equilibria: _____

5.

$$\frac{dy}{dx} = -3 \cdot \sin(x - 3) \cdot y^3$$

Implicit solution and equilibria: _____

6.

$$\frac{dy}{dx} = \frac{-1}{2} \cdot x \cdot y^2$$

Implicit solution and equilibria: _____

7.

$$\frac{dy}{dx} = \frac{3}{2} \cdot x \cdot e^{3 \cdot y}$$

Implicit solution and equilibria: _____

8.

$$\frac{dy}{dx} = \frac{5 \cdot x^3}{y^2}$$

Implicit solution and equilibria: _____

9.

$$\frac{dy}{dx} = \frac{-2}{3} \cdot \sec(-1 \cdot x)^2 \cdot y^3$$

Implicit solution and equilibria: _____

10.

$$\frac{dy}{dx} = 5 \cdot x^3 \cdot y^3$$

Implicit solution and equilibria: _____

11.

$$\frac{dy}{dx} = x^4 \cdot \sin(3 \cdot y)^2$$

Implicit solution and equilibria: _____

12.

$$\frac{dy}{dx} = \frac{-2 \cdot x}{y^3}$$

Implicit solution and equilibria: _____

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13.

$$\frac{dy}{dx} = \frac{3}{2} \cdot \csc(-1 \cdot x)^2 \cdot y$$

Implicit solution and equilibria: _____

14.

$$\frac{dy}{dx} = 6 \cdot x^0 \cdot y$$

Implicit solution and equilibria: _____

15.

$$\frac{dy}{dx} = \frac{\frac{1}{2} \cdot e^x}{y^2}$$

Implicit solution and equilibria: _____

16.

$$\frac{dy}{dx} = \frac{3 \cdot x}{y}$$

Implicit solution and equilibria: _____

17.

$$\frac{dy}{dx} = \frac{\frac{2}{3} \cdot \sec(-3 \cdot x - 1) \cdot \tan(-3 \cdot x - 1)}{y^3}$$

Implicit solution and equilibria: _____

18.

$$\frac{dy}{dx} = 7 \cdot x^3 \cdot y^2$$

Implicit solution and equilibria: _____

19.

$$\frac{dy}{dx} = -4 \cdot x^0 \cdot e^{-1 \cdot y}$$

Implicit solution and equilibria: _____

20.

$$\frac{dy}{dx} = \frac{3 \cdot x}{y^2}$$

Implicit solution and equilibria: _____

21.

$$\frac{dy}{dx} = \csc(-x + 1) \cdot \cot(-x + 1) \cdot y^2$$

Implicit solution and equilibria: _____

22.

$$\frac{dy}{dx} = 4 \cdot x^2 \cdot y^3$$

Implicit solution and equilibria: _____

23.

$$\frac{dy}{dx} = -3 \cdot x^3 \cdot \cos(2 \cdot y)^2$$

Implicit solution and equilibria: _____

24.

$$\frac{dy}{dx} = \frac{-4 \cdot x^0}{y^3}$$

Implicit solution and equilibria: _____
