

Solving ODEs Review

Supplemental Instruction
Iowa State University

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Course: Math 267

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1. Fill out the following chart with ways to tell whether an equation can be solved by the separable method, the linear method, or the exact method.

Separable	Linear	Exact

2. Find the general solution of the given differential equations.

a. $y' = \frac{-3x^2 \sin(y)}{x^3 \cos(y) + 4y}$

b. $\frac{dy}{dt} + 2(t+1)y^2 = 0$

c. $xy' + (3x+1)y = e^{-3x}$

d. $y(x+y+1)dx + (x+2y)dy = 0$

3. Solve the given initial-value problems.

a. $x dx + (x^2 y + 4y) dy, y(4) = 0$

b. $x \frac{dy}{dx} + y = 4x + 1, y(1) = 8$

c. $(x+1) \frac{dy}{dx} + y = \ln x, y(1) = 10$

d. $\frac{dx}{dt} = 4(x^2 + 1), x\left(\frac{\pi}{4}\right) = 1$