



Problem Set 36: Differential Equations

What is the order of the differential equation (first order, second order, etc.)?

1. $y - x^2 = \frac{d^2y}{dx^2} + y^3$

2. $y' + 2\sqrt{xy} = 6y'''$

Find the particular solution for the differential equation.

3. $\frac{dy}{dx} = 2x + 2 ; y(0) = 4$

4. $\frac{dy}{dx} = \frac{xy}{3} ; y(3) = 1$

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5. $y' = \frac{x^2}{y^2}$; $y(1) = 2$

6. $\frac{dy}{dx} = \frac{\sin x}{y}$; $y(\pi) = 2$

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7. $y' = y^2 + 1$; $y\left(\frac{\pi}{4}\right) = 1$

8. $\frac{dy}{dx} = \frac{4xy}{x^2 + 2}$; $y(0) = 4$

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9. $\frac{d^2y}{dx^2} = x + 2$; $y'(2) = 0$, $y(-1) = 2$

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10. $y'' + x^2 = 2\sqrt{x}$; $y'(1) = 1$, $y(0) = 4$