



ChapterNotes

chapternotes.in · free NEET & JEE prep

CHAPTER NOTES

Differential Equations Class 12 Notes — CBSE Maths Chapter 9

- ✓ Chapter-wise notes & important questions
- ✓ Free gamified practice app — streaks, levels, revision
- ✓ Free mock & prediction papers with answer keys

Source: <https://chapternotes.in/cbse/class-12-maths/differential-equations-class-12-notes/>



Scan for free practice,
mocks & more notes

Differential Equations Class 12 Notes — CBSE Maths

Chapter 9

Chapter 9 — **Differential Equations** — covers order, degree, formation, and solving differential equations (variable separable, homogeneous, linear). Carries **6-8 marks**.

Key Concepts

Order and Degree

Order: Highest order derivative present

Degree: Power of the highest order derivative (after removing radicals/fractions)

Degree is defined only when DE is polynomial in derivatives

Methods of Solving

1. Variable Separable

$$dy/dx = f(x)g(y) \rightarrow \int dy/g(y) = \int f(x)dx$$

2. Homogeneous Equations

$dy/dx = F(y/x)$ — substitute $y = vx$, $dy/dx = v + x(dv/dx)$

Separate variables in v and x , then integrate

3. Linear Differential Equation

Form: $dy/dx + Py = Q$ (where P, Q are functions of x)

Integrating Factor (IF): $e^{\int P dx}$

Solution: $y \times IF = \int (Q \times IF) dx + C$

Also: $dx/dy + Px = Q$ (P, Q functions of y): $IF = e^{\int P dy}$

Solved Examples

Example 1: Variable Separable

Q: Solve $dy/dx = (1+y^2)/(1+x^2)$

Solution: $dy/(1+y^2) = dx/(1+x^2)$

$$\int dy/(1+y^2) = \int dx/(1+x^2)$$

$$\tan^{-1}y = \tan^{-1}x + C$$

Example 2: Linear DE

Q: Solve $dy/dx + y/x = x^2$

Solution: $P = 1/x$, $Q = x^2$. $IF = e^{\int 1/x \, dx} = e^{\ln x} = x$

$$y \cdot x = \int x^2 \cdot x \, dx = \int x^3 \, dx = x^4/4 + C$$

$$y = x^3/4 + C/x$$

Quick Revision Points

- Order = highest derivative; Degree = power of highest order derivative
- Variable separable: $f(x)dx = g(y)dy$
- Homogeneous: put $y = vx$; converts to separable
- Linear: $dy/dx + Py = Q$; $IF = e^{\int P \, dx}$; Solution: $y \cdot IF = \int Q \cdot IF \, dx + C$
- Number of arbitrary constants = order of DE

← Previous

Next: Vector Algebra →



Got this PDF from a friend?

Everything here is free at **chapternotes.in** — 134 chapters of notes, a gamified practice app, and full NEET mock & prediction papers.



Scan for free practice, mocks & more notes