

PRACTICE WORKBOOK

CLASS 12

Applied Mathematics

Six applied board-year units covering numerical and matrix models, calculus, distributions, sampling and time series, financial mathematics and linear programming. Selected practice for CBSE 2026–27.



6 practice units
36 tasks with answer guidance

Name / नाम: _____

Original selected-topic practice. Use alongside school lessons and the prescribed textbook. The contents define this book's scope.

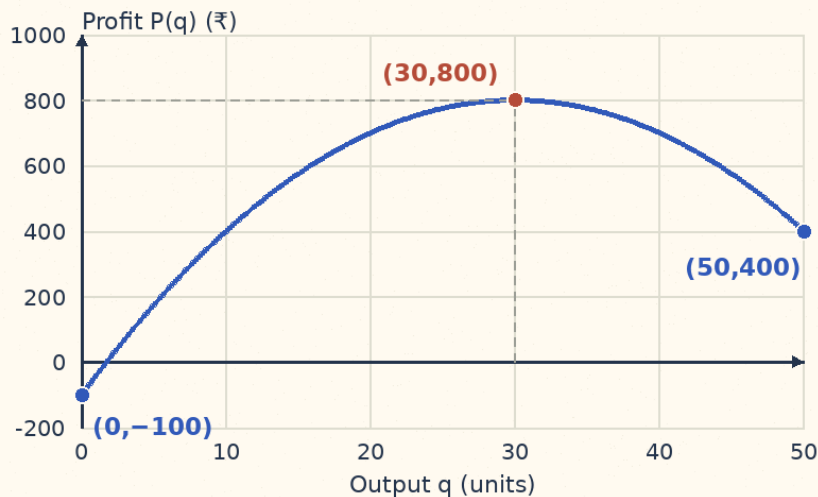
CBSE course 241 · 2026–27 · Selected practice, not a complete syllabus or official examination paper.

UNIT 02 · LOOK & EXPLAIN

Marginal quantities, optima and totals

Profit peaks inside the permitted domain

Worked example: $P(q) = 60q - q^2 - 100$; $0 \leq q \leq 50$



$$P'(q) = 60 - 2q$$

$$P'(30) = 0$$

$$P''(q) = -2 < 0$$

Endpoint profits:

$$P(0) = -₹100$$

$$P(50) = ₹400$$

$$\text{Best: } P(30) = ₹800$$

The curve and both endpoints are checked. The conclusion applies to the stated domain and model.

Use the labels and worked example to explain the idea. The diagram is schematic unless a scale is given.

Look, annotate and explain

Identify the parts or values that matter. Add a label or annotation to show a connection. Explain how the diagram supports the worked example, then use it with the practice on the next page.

UNIT 01 · APPLY & EXPLAIN

Quantification and matrix models

4. For $A = \begin{bmatrix} 2 & 1 \\ 1 & 3 \end{bmatrix}$, find $\det A$ and A^{-1} . [3 marks]

5. Solve $2x + y = 11$ and $x + 3y = 18$ using that inverse. [3 marks]

6. For $M = \begin{bmatrix} 2 & 4 \\ 1 & 2 \end{bmatrix}$, can an inverse matrix solve every right-hand-side system? Explain. [2 marks]

Show your thinking with a drawing, diagram or explanation.

Pause & reflect

What can I explain now? What will I try again?

☐ I tried ☐ I explained ☐ I checked



UNIT 01 · ANSWER GUIDANCE

Quantification and matrix models

1. $47 = 6 \times 7 + 5$ gives residue 5. Sum 66 is divisible by 6, giving residue 0.
2. Alligation ratio = $(70 - 52):(52 - 40) = 18:12 = 3:2$.
3. Downstream speed 15: time $27/15 = 1.8$ h. Upstream speed 9: time $27/9 = 3$ h.
4. $\det A = 6 - 1 = 5$. $A^{-1} = (1/5)[[3, -1], [-1, 2]]$.
5. $[[x], [y]] = (1/5)[[3, -1], [-1, 2]][[11], [18]] = (1/5)[[15], [25]]$. Thus $x = 3$ and $y = 5$.
6. $\det M = 4 - 4 = 0$, so M has no inverse. Depending on the right-hand side, a system may have no solution or infinitely many; it does not have a unique inverse-based solution.

Teaching note

Keep variable order fixed when creating a coefficient matrix.

Curriculum reference: https://cbseacademic.nic.in/web_material/CurriculumMain27/SecPart2/Applied_Mathematics_SecP2_2026-27.pdf

Selected units; outcomes are publisher-defined. Practical, project and prescribed literature requirements must also be studied through school.