

Applied Mathematics

Original practice in 12 topic units, with explanations, worked examples and answer guidance. Use alongside the prescribed texts and syllabus.



12 practice units

72 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 01 / 12 · LEARN & TRY

Numerical tools for everyday models

Name: _____ Date: _____

Goal: Convert bases and use logarithms, clock angles and constant-rate models.

Learn

Binary notation uses place values 1, 2, 4, 8 and successive powers of two, with each digit zero or one. Attach a base subscript when confusion with decimal is possible. A logarithm reverses exponentiation: $\log_b a = c$ means $b^c = a$, with $a > 0$, $b > 0$ and $b \neq 1$. Product and quotient laws become addition and subtraction of logarithms, but there is no comparable rule turning $\log(a + b)$ into $\log a + \log b$. In rate problems, first put distance and time in consistent units. If two independent workers complete the same task at constant rates, add their fractions of a task per day, not their completion times. A clock's minute hand moves 6° per minute and its hour hand moves 0.5° per minute. The hour hand keeps moving between hour marks. State these assumptions before interpreting a numerical model.

Worked example

One worker completes a task in 6 days and another in 3 days. Their daily rates are $\frac{1}{6}$ and $\frac{1}{3}$. Working together at these unchanged rates, the combined rate is $\frac{1}{2}$ task per day, so completion time is 2 days.

1. Convert binary 101101_2 to decimal and decimal 19 to binary. [2 marks]

2. Evaluate $\log_{10}(1000) - \log_{10}(10)$. [1 marks]

3. Solve $2^{(x + 1)} = 32$. [1 marks]

UNIT 01 · PRACTISE · 4–6

Numerical tools for everyday models

4. Find the smaller angle between clock hands at 3:20. [2 marks]

5. Workers A and B finish a task separately in 8 and 12 days. Find their joint completion time at constant independent rates. [2 marks]

6. A cyclist travels 12 km at 12 km/h and another 12 km at 6 km/h. Find the average speed for the whole trip. [3 marks]

Explain one answer. Choose a question to revisit after a few days.

UNIT 01 · ANSWER GUIDANCE

Numerical tools for everyday models

1. $101101_2 = 32 + 8 + 4 + 1 = 45$. $19 = 16 + 2 + 1$, so $19 = 10011_2$.
2. $3 - 1 = 2$; equivalently $\log_{10}(100) = 2$.
3. $32 = 2^5$, so $x + 1 = 5$ and $x = 4$.
4. Minute angle from 12 = $20 \times 6 = 120^\circ$. Hour angle = $3 \times 30 + 20 \times 0.5 = 100^\circ$. Smaller difference = 20° .
5. Combined rate = $1/8 + 1/12 = 5/24$ task/day. Time = $24/5 = 4.8$ days.
6. Total distance = 24 km. Time = $12/12 + 12/6 = 3$ hours. Average speed = $24/3 = 8$ km/h; it is not the arithmetic mean 9.

Teaching note

Average speed uses total distance divided by total time.

Curriculum reference: https://cbseacademic.nic.in/web_material/CurriculumMain27/SecPart2/

Applied_Mathematics_SecP2_2026-27.pdf

Selected practice; outcomes are publisher-defined. School practicals, projects and prescribed readings require separate preparation.