CLASS 10

CBSE

PHYSICS WALLAH

15 SAMPLE QUESTION PAPERS

With ***Cheat Sheets*** *&*
100 ***Most Probable Questions***

MATHEMATICS BASIC

With CBSE SQP, 2023, 2024 & 2025 Solved Papers

2026 EXAMINATION

50% ADHERED TO **COMPETENCY** AS PER CBSE 2024-25 SQP

Chapter Wise Weightage & Trend analysis

CBSE PAST 5 YEARS' PAPERS

MATHEMATICS					
CHAPTERS	2020	2022	2023	2024	2025
Real Numbers	5	-	6	6	6
Polynomials	5	-	2	5	4
Pair of Linear Equations in Two Variables	4	-	5	6	6
Quadratic Equations	5	4	8	4	5
Arithmetic Progressions	5	6	5	5	5
Triangles	6	-	7	8	8
Coordinate Geometry	6	-	6	6	6
Introduction to Trigonometry	7	-	6	7	6
Some Applications of Trigonometry	4	7	6	5	6
Circles	3	6	8	7	7
Areas Related to Circles	3	-	5	5	4
Surface Areas and Volumes	4	4	5	5	6
Statistics	5	8	6	7	6
Probability	6	-	5	4	5

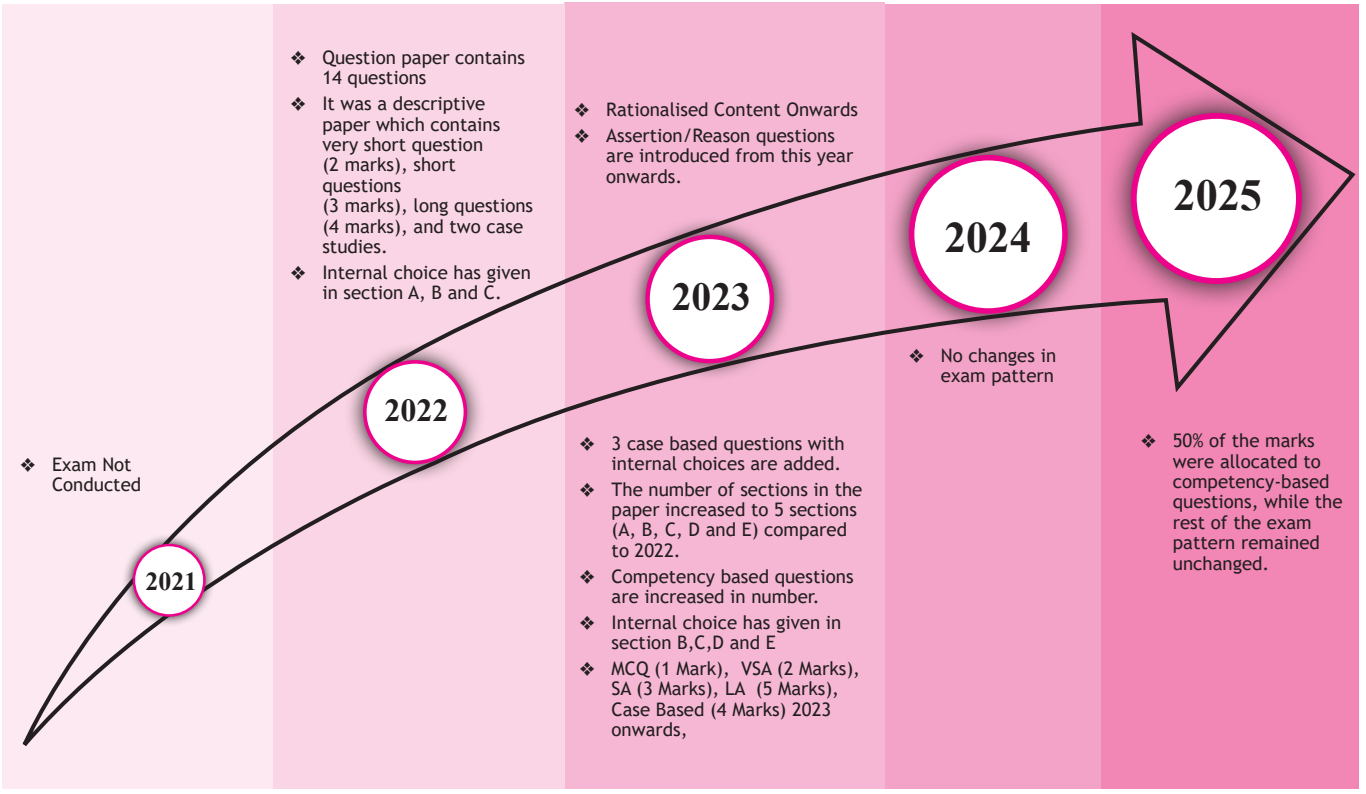
**The marks allotment mentioned above is chapter-wise and includes internal choice questions as well. Therefore, the total might not match the Maximum Marks of the respective Previous Year Paper.*

**For the year 2021, the exam was not conducted.*

Question Typology

YEAR	Objective Questions		Subjective Questions				
	MCQs	A/R	Fill in the Blanks	VSA	SA	LA	Case Based type
2025	18	2	-	5	6	4	3
2024	18	2	-	5	6	4	3
2023	18	2	-	5	6	4	3
2022	-		-	-	10	2	2
2021	Exam Not Conducted						

Evolving Trends in CBSE Exam Patterns



Preparation Guide!

❖ Chapter-wise Weightage & Trend Analysis

Revise smartly with a clear understanding of chapter-wise marks distribution based on the last 5 years of CBSE board exams. Identify high-weightage chapters and focus your efforts strategically.

❖ Answering Templates

Master the art of writing scoring answers using pre-designed templates. Learn how to structure your responses as per CBSE's expectations—write precisely, score efficiently.

❖ Board-based FAQs

Get clear, concise answers to all your common questions about the CBSE board exams and the latest 2026 exam pattern. Scan the QR provided for more FAQs.

❖ CBSE 2026: Two Board Exams Scheme

Understand the new Two-Exam System introduced by CBSE—its purpose, key features, and how it changes your preparation strategy. Gain clarity on what it means for phase 1 and phase 2.

❖ OMR Mastery

Follow step-by-step guidance on correctly filling the OMR sheet. Learn the dos and don'ts to ensure accuracy and avoid common mistakes.

❖ Practice Pack: 12 SQPs

Start with easy level SQPs to build confidence and move to medium difficulty level SQPs for skill-building. Challenge yourself with hard sample papers for full-syllabus preparation and deeper insight.

❖ Solutions with Step-wise Marking Scheme

Get detailed, stepwise solutions for every question. Understand answer logic, avoid frequent errors, and learn the marking scheme.

❖ Recent CBSE Board Papers & SQPs

Practice with the latest Sample Question Paper (2025–26), along with 2024 and 2025 board papers. Understand evolving patterns, new question types, and updated evaluation trends.

CONTENTS

Scan for Latest Syllabus & Upcoming CBSE SQPs

IV. Explanations

V. CBSE Solved Papers

Frequently Asked Questions

Scan for More FAQs

1 **Question:** Are the total number of questions, total marks and duration the same in CBSE SQP 2025-26 and 2025 Board Paper?

Answer: Yes. Both consist of 38 questions, carry a total of 80 marks, and have a duration of 3 hours.

2 **Question:** Is there any change in the assessment scheme for the current academic session (2025–26)?

Answer: No. There is no change in the assessment scheme for 2025–26. It remains the same as that of the academic session 2024–25.

3 **Question:** I have a doubt whether the pre-board examinations marks would be considered in the board examinations?

Answer: No, the marks obtained in the pre-board examination are not added or included in the Board examination marks.

4 **Question:** If a choice is given to attempt any one of the questions in the Board exam, can we attempt both? If yes, which answer would be considered?

Answer: The instructions given in the question paper should be followed. Attempting both the options not only takes away much of the precious time but also confuses the examiner.

5 **Question:** Is it compulsory to write the answers in the same sequence as in the question paper?

Answer: No, you may attempt those questions in the beginning which you know best. Make sure that you write correct answer number to each question.

6 **Question:** Do examiners deduct marks for exceeding the word limit and spelling mistakes, especially in the language papers?

Answer: No marks are deducted for exceeding the word limit. Marks for spelling mistakes and other errors are deducted in the Language Papers.

7 **Question:** Will questions be asked from the Board's sample paper?

Answer: Sample question papers help you know the design, pattern and types of questions. Questions in the examination may be from any part of the syllabus. So, prepare thoroughly from the entire syllabus

8 **Question:** How can we obtain a copy of the Answers Book of Class 10th exam?

Answer: Applicant may apply for obtaining photocopy of answer books by paying prescribed processing charges as per time frame set by the Board. For details please see our website www.cbse.nic.in at the time of declaration of results.

CBSE Board Exam 2026: Two-Exam Scheme Decoded

1. What is the major change in Class X Board exams from 2026?

Ans: Starting in 2026, CBSE will conduct two Board exams per year for Class X, one main examination and one for improvement, if desired. This aims to offer students more flexibility and reduce pressure.

2. Why are two Board exams being introduced?

Ans: This is in line with the National Education Policy (NEP) 2020, which emphasizes holistic assessment, focus on core competencies, and reducing rote memorization.

Two Board exams aim to eliminate the high-stress/high-stakes nature of a single final exam and provide students more opportunities to improve.

3. Can I appear for both exams in the same year?

Ans. Yes, you can appear in both exams within the same school year:

First Board Examination (Main Exam)

You must appear in the first Board Examination, as it is mandatory for all students.

Eligible categories:

- Fresh students of Class X
- Students in Compartment (2nd Chance)
- Students repeating the year (Essential Repeat)
- Students appearing for improvement of previous performance

Second Board Examination

You can appear in the second examination in the following cases:

- Improvement: For up to 3 subjects to improve your score.
- Compartment: If you were placed in Compartment in the first phase exam.
- Improvement + Compartment: You can appear for both in May.
- Improvement for the students passed by the replacement of the subject.

Note: You are not allowed to take the second examination if you didn't appear in at least 3 subjects during the first examination. In such cases, you'll fall under the "Essential Repeat" category and have to wait until the next year.

4. When will the exams be held?

Ans. First Phase Examination: 17 February to 6 March 2026

Second Phase Examination: 5 May to 20 May 2026

5. Is it mandatory to attempt the First Phase exam for all students?

Ans. Yes, it is mandatory to attempt the First Phase Exam for all Class X students. It will be treated as the main board examination.

6. Is it mandatory to attempt the Second Phase exam? Who can appear for it?

Ans. No, the May exam is not mandatory. It is an optional attempt meant for:

- Students who want to improve their scores
- Students who were absent or could not perform well in the February exam
- Students who fail in one or more subjects in the first phase

7. Will the syllabus remain the same for both first and second examinations?

Ans. Yes, the syllabus will be the same for both the first and second examinations. Both examinations will be based on the full syllabus prescribed for the academic year.

INSTRUCTIONS FOR FILLING THE OMR SHEET

- Use a black or blue ballpoint pen to fill the OMR sheet. Pencils or gel pens are not allowed.
- Carefully read the instructions given on the OMR sheet before filling it out.
- While filling the name, leave a block between your first name, middle and last name.
- The student has to fill the following particulars in the answer sheet:

From Admit Card

1. Subject
2. Sub Code
3. Date of Examination
4. Candidate's Name
5. Father's Name
6. Roll No. (In digits)
7. Roll No. (In words)
8. Centre No.
9. School No.

From Question Paper

10. Set Number
11. Code Number

ADMIT CARD

CENTRAL BOARD OF SECONDARY EDUCATION, DELHI

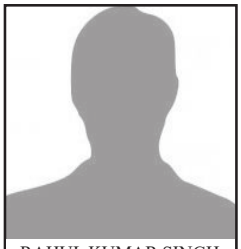
ADMIT CARD FOR SECONDARY EXAMINATION 2026

LATEST ENTRY IN EXAMINATION CENTRE 30 MIN BEFORE THE EXAM START 10 AM (IST)

Digital CBSE

Roll No. (6) **22122532** **Date of Birth** **26/02/2008** **School No.** (9) **65345** **Centre No.** (8) **8407**

Roll. No. (In words) (7) **TWO CRORE TWENTY ONE LAKH TWENTY TWO THOUSAND FIVE HUNDRED THIRTY TWO ONLY**



RAHUL KUMAR SINGH
11-04-2025

Examination	SECONDARY - CLASS: 10
Candidate's Name (4)	RAHUL KUMAR SINGH
Mother's Name	REKHA DEVI
Father/Guardian's Name (5)	OM PRAKASH SINGH
of School	M D J PUB SCH LOHAI TOLA AMARPURI ARA BHOJPUR BR
Exam Centre	D A V SCHOOL DULOUR DIH JAGDISHPUR BHOJPUR BR
Category of PwD	Not Applicable
Admit Card ID	RR536521

(2) SUB CODE	(1) SUBJECT NAME	MEDIUM	(3) DATE
002	HINDI COURSE-A	...	21.02.2026
184	ENGLISH (LANGUAGE AND LITERATURE)	...	26.02.2026
086	SCIENCE	...	02.03.2026
087	SOCIAL SCIENCE	...	07.03.2026
241	MATHEMATICS BASIC	...	11.03.2026

QUESTIONPAPER

Series WYXZ1/4

(10) **Set No. 2**

(11) Q.P. Code **2/4/2**

Roll No.

1	4	1	2	5	1	1	8

Candidates must write the Q.P. Code on the title page of the answer book.

केन्द्रीय माध्यमिक शिक्षा बोर्ड, दिल्ली
सीनियर स्कूल सर्टिफिकेट परीक्षा (कक्षा बारहवीं)
परीक्षार्थी प्रवेश-पत्र के अनुसार भरे

CENTRAL BOARD OF SECONDARY EDUCATION, DELHI
Secondary School Examination (Class-X)
To be filled in by the candidate as per as per Admit Card
लिखे तथा संगत गोले को पूरे गहरे निशान से भरें।
Write and darken the appropriate circle as applicable.

क्रम संख्या
Serial No.

SAMPLE

विषय **Subject:** SCIENCE

विषय कोड **Subject Code:** 086

परीक्षा का दिन एवं तिथि
Day & Date of the Examination: MONDAY 02/03/2026

उत्तर देने का माध्यम
Medium of answering the paper: ENGLISH

प्रश्न पत्र के ऊपर लिखे कोड को दर्शाए:
Write code No. as written on the top of the question paper

Code Number	Set Number
2/4/2	① ● ③ ④

अतिरिक्त उत्तर-पुस्तिका (ओं) की संख्या
No. of supplementary answer-book(s) used

विकलांग व्यक्ति: हाँ / नहीं
Person with Disabilities: Yes / No — NO

किसी शारीरिक अक्षमता से प्रभावित हो तो संबंधित वर्ग में ✓ का निशान लगाऐं।

If physically challenged, tick the category

B	D	H	S	C	A

B = दृष्टिहीन, D = मूक व वधिर, H = शारीरिक रूप से विकलांग,
S = स्पास्टिक, C = डिस्लेक्सिक, A = ऑटिस्टिक

B = Visually Impaired, D = Hearing Impaired, H = Physically Challanged
S = Spastic, C = Dyslexic, A = Autistic

क्या लेखन - लिपिक उपलब्ध करवाया गया: हाँ / नहीं
Whether writer provided: Yes / No — NO

यदि दृष्टिहीन है तो उपयोग में लाए गये सोफ्टवेयर का नाम:
If Visually challenged, name of software used:

एक खाने में एक अक्षर लिखें। नाम के प्रत्येक भाग के बीच एक खाना रिक्त छोड़ दें। यदि परीक्षार्थी का नाम 24 अक्षरों से अधिक है, तो केवल नाम के प्रथम 24 अक्षर ही लिखें।
Each letter be written in one box and one box be left blank between each part of the name. In case Candidate's Name exceeds 24 letters, write first 24 letters.

परीक्षार्थी का नाम बड़े अक्षरों में **Candidate's Name in CAPITAL letters**

R	A	H	U	L		K	U	M	A	R		S	I	N	G	H										

अनुक्रमांक
Roll No.

2	2	1	2	2	5	3	2

As per Admit Card

विषय कोड
Sub. Code

0	8	6

केन्द्र संख्या
Centre No.

8	4	0	7

विषय **Subject:** SCIENCE

School No. as per admit card:
विद्यालय संख्या जैसा प्रवेश पत्र में दिया गया है।

6	5	3	4	5

अनुक्रमांक (शब्दों में) **Roll No. (in words)** TWO Crore TWENTY ONE Lakhs TWENTY TWO Thousands FIVE HUNDRED THIRTY TWO ONLY

पिता/संरक्षक का नाम
Father's/Guardian's Name: OM PRAKASH SINGH

परीक्षार्थी के हस्ताक्षर **Signature of Candidate:** *(Candidate's signature in black/blue ballpoint pen)*

कार्यालय उपयोग के लिए
Space for office use

इस पृष्ठ पर परीक्षार्थी द्वारा भरे गए सम्पूर्ण विवरण की जांच कर ली गई है।
All the particulars filled in by the candidate on this page have been verified

सहायक अधीक्षक के हस्ताक्षर
Signature of Asstt. Supdt.

अधीक्षक की मोहर
Facsimile sstamp of the Centre supdt.

SELF ASSESSMENT

Self-assessment plays a crucial role in exam preparation and offers several advantages:

- **Enhanced Self-awareness:** Self-assessment sheets help students gain a deeper understanding of their strengths and weaknesses across various subjects. Specific feedback on their performance provides valuable insights into areas of excellence and those that require improvement.
- **Focused Study:** These sheets provide clear guidance to students on where to direct their efforts. Identifying which questions to review, reattempt, or practice allows for more efficient and purposeful study sessions.
- **Targeted Improvement:** By categorizing questions into different categories (e.g., Easy, Revise, Reattempt), students can concentrate on areas that require the most attention. This targeted approach can result in significant improvements in their comprehension and performance.
- **Motivation:** Self-assessment sheets serve as a source of motivation for students. Observing their progress and understanding the steps needed for improvement can boost their motivation to work harder and achieve better results.
- **Reduced Exam Anxiety:** Having a clear understanding of their preparation progress helps reduce exam-related anxiety. Students feel more confident when they know what aspects to focus on, leading to a calmer and more effective exam experience.
- **Time Management:** Self-assessment sheets aid students in managing their study time more effectively. They can allocate more time to areas requiring extensive revision or reattempt while spending less time on topics they have already mastered.

Self evaluation Instruction: After completing the test, evaluate it using the provided explanations. Use only a pencil to mark the evaluations (allowing for revisions and reattempts). Record the marks obtained in the Marks section and provide remarks in the Remarks column.

Remarks abbreviations:

- **Easy (E):** Use for questions that you should find straightforward, indicating a good understanding and correct answers.
- **Revise (R):** Assign to questions where your response contains minor errors or gaps in understanding, suggesting the need for topic review.
- **Reattempt (RA):** Use for questions with incorrect responses, significant misconceptions, or a lack of understanding. Students receiving this remark should revisit the topic thoroughly, seek additional help if necessary, and attempt similar questions to enhance their grasp of the concept.

	SQP 1		SQP 2		SQP 3		SQP 4		SQP 5		SQP 6		SQP 7	
S.No.	Marks	Remarks	Marks	Remarks	Marks	Remarks	Marks	Remarks	Marks	Remarks	Marks	Remarks	Marks	Remarks
Q.1														
Q.2														
Q.3														
Q.4														
Q.5														
Q.6														
Q.7														
Q.8														
Q.9														
Q.10														
Q.11														
Q.12														
Q.13														
Q.14														
Q.15														
Q.16														
Q.17														
Q.18														
Q.19														
Q.20														
Q.21														
Q.22														
Q.23														
Q.24														
Q.25														
Q.26														
Q.27														
Q.28														
Q.29														
Q.30														
Q.31														
Q.32														
Q.33														
Q.34														
Q.35														
Q.36														
Q.37														
Q.38														
Total														

EXAM READY: ANSWERING TEMPLATES THAT SCORE

Proving (Equation Based) Type

Q. If $\cos\theta + \sin\theta = 1$, when prove that $\cos\theta - \sin\theta = \pm 1$

Ans.

Given: It is given that $\cos\theta + \sin\theta = 1$.

To prove: _____

Explanation: Start by squaring both sides of the given equation $\cos\theta + \sin\theta = 1$.

_____

_____

Conclusion: Hence, $\cos\theta - \sin\theta =$ _____

Proving (Theorem/Concept Based) Type

Q. Prove that $\sqrt{3}$ is an irrational number.

Ans.

To prove: _____

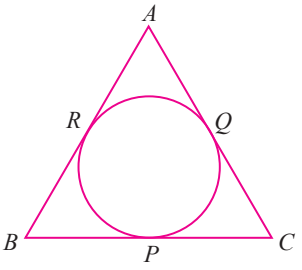
Explanation: Assume that $\sqrt{3}$ is _____ and can be written as _____

_____

Conclusion: Hence, $\sqrt{3}$ is _____

Q. Prove that the lengths of tangents drawn from an external point to a circle are equal.

Using above result, find the length BC of ΔABC. Given that, a circle is inscribed in ΔABC touching the sides AB, BC and CA at R, P and Q respectively and $AB = 10$ cm, $AQ = 7$ cm, $CQ = 5$ cm.



Ans.

Given: $AB =$ _____ cm, $AQ =$ _____ cm, $CQ =$ _____ cm.

To find: _____

Explanation: Start by using the property that the lengths of tangents drawn from an _____ to a circle are _____

_____

Conclusion: Hence, the length of BC is _____

Evaluation Type

Q. The minute hand of a wall clock is 18 cm long. Find the area of the face of the face of the clock described by the minute hand in 35 minutes.

Ans.

Given: Length of the minute hand = 18 cm, Time interval = 35 minutes

To find: _____

Construct the diagram: First, we will draw the circle representing the clock face.

Explanation: Indicate the position of the minute hand at the start and after 35 minutes.

_____

_____

_____

Conclusion: The area described by the minute hand is _____ cm^2.

Q. A boy whose eye level is 1.35 m from the ground, spots a balloon moving with the wind in a horizontal line at some height from the ground. The angle of elevation of the balloon from the eyes of the boy at an instant is 60°. After 12 seconds, the angle of elevation reduces to 30°. If the speed of the wind is 3 m/s then find the height of the balloon from the ground. (Use $\sqrt{3}$ = 1.73)

Ans.

Given: Eye level height: 1.35 m, Speed of the wind: 3 m/s, Initial angle of elevation = 60° & Final angle of elevation = 30°

To find: _____

Construct the diagram: First, we will draw the positions of the boy's eye level and the balloon. Mark the angles of elevation.

Explanation: Now, we will apply the trigonometric ratios

_____

_____

_____

_____

Conclusion: The height of the balloon from the ground is _____ m.

Case-Based

Q. Ms. Sheela visited a store near her house and found that the glass jars are arranged one above the other in a specific pattern. On the top layer there are 3 jars. In the next layer there are 6 jars. In the 3rd layer from the top there are 9 jars and so on till the 8th layer.

CHAPTER-1
REAL NUMBERS

To Access One Shot Revision Video Scan This QR Code

Cheat Sheet

Real Numbers

The Fundamental Theorem of Arithmetic:

- Every composite number can be expressed (factorized) as a product of primes, and this factorisation is unique, apart from the order in which the prime factors occur.

  Note: Fundamental theorem of arithmetic is called a Unique Factorisation Theorem.

  Composite number = Product of prime numbers.

  e.g. $\therefore$ $24 = 2 \times 2 \times 2 \times 3$

  $= 2^3 \times 3$, where 2 and 3 are prime numbers

Theorems:

- **Theorem 1:** Let p be a prime number. If p divides a^2, then p divides a, where a is a positive integer.
- **Theorem 2:** $\sqrt{2}$ is an irrational number.

  Note: Square root of any prime number is always an irrational number

Irrational Numbers:

It cannot be expressed as $x = \frac{p}{q}$, $q \neq 0$. where p and q are integers.

e.g.: $\sqrt{2}, \sqrt{3}, \pi, \ldots$

Prime Factorisation Method:

Prime Factorisation is a way of representing a number as a product of its prime factors. It is also used to find out the H.C.F and L.C.M.

For any two positive integers a and b we have,

H.C.F $(a, b) \times$ L.C.M $(a, b) = a \times b$

e.g.: Find H.C.F of 24 and 36.

Prime factors of 24 : $2^3 \times 3^1$

Prime factors of 36 : $2^2 \times 3^2$

H.C.F = $2^2 \times 3^1 = 12$

e.g.: Find L.C.M of 12 and 18.

Prime factors of 12 : $2^2 \times 3^1$

Prime factors of 18 : $2^1 \times 3^2$

L.C.M = $2^2 \times 3^2 = 36$

Rational Numbers:

It can be expressed as $x = \frac{p}{q}$, $q \neq 0$. where p and q are integers.

e.g.: $\frac{1}{4}, \frac{2}{3}, 2, \ldots$

Integers 'Z' or 'I':

Integers include all whole numbers and negative numbers.

e.g.: … –3, –2, –1, 0,2,3,.....

Negative Integer:

e.g.: –1, –2, –3, …

Whole Number 'W':

The whole number which includes all the non-negative integers.

W: 0, 1, 2, 3, …

Zero

Natural Number 'N':

Natural numbers are all positive integers

N: 1, 2, 3, …

Prime Number:

Prime numbers are natural numbers that are divisible by only 1 and the number itself.

e.g. 2, 3, 5, 7, 11, 13.....

Composite Number:

Composite numbers are numbers that have more than two factors.

e.g. 4, 6, 8, 9, 10, 12....

Co-prime Number:

Co-prime numbers are two pairs of numbers which have a common factor of 1.

e.g. (14,15), (1,99), (8,15)

CHAPTER-2
POLYNOMIALS

To Access One Shot Revision Video Scan This QR Code

Cheat Sheet

Polynomial:
A polynomial is defined as an expression that includes variables, constants and exponents.

Types of Polynomial

Linear Polynomial:
$p(x) = ax + b, a \neq 0$

Quadratic Polynomial:
$p(x) = ax^2 + bx + c, a \neq 0$

Cubic Polynomial:
$p(x) = ax^3 + bx^2 + cx + d, a \neq 0$

Degree of Polynomial:
Highest power of the variable is known as the degree of the polynomial.

Formation of Quadratic and Cubic Polynomial:

1. Quadratic polynomial having α and β as its zeroes is given by $p(x) = k\{x^2 - (\alpha + \beta)x + \alpha\beta\}$, where k is any non-zero real number.
2. Cubic polynomial having α, β, and γ as its zeroes is given by $p(x) = k\{x^3 - (\alpha + \beta + \gamma)x^2 + (\alpha\beta + \beta\gamma + \gamma\alpha)x - \alpha\beta\gamma\}$, where k is any non-zero real number.

General Form:
$p(x) = a_0x^n + a_1x^{n-1} + a_2x^{n-2} + a_3x^{n-3} + ... + a_{n-1}x^1 + a_n$,
where all the powers are non-negative integers and
$a_0, a_1, ... a_n, \in R$

Zeroes of Polynomials:
The value of x where the graph intersect x-axis

Zeroes of Linear Polynomial:
If k is zero of $p(x) = ax + b, a \neq 0$
i.e. $p(k) = ak + b = 0$

$$\therefore k = \frac{-b}{a} = \frac{-\text{ Constant term}}{\text{Coefficient of } x}$$

Zeroes of Quadratic Polynomial:
If α and β are zeroes of quadratic polynomial $p(x) = ax^2 + bx + c, a \neq 0$

$$\alpha + \beta = \frac{-b}{a} = \frac{-\text{ Coefficient of } x}{\text{Coefficient of } x^2}$$

$$\text{and } \alpha \cdot \beta = \frac{c}{a} = \frac{\text{Constant term}}{\text{Coefficient of } x^2}$$

Zeroes of Cubic Polynomial:
If α, β, and γ are the zeroes of the cubic polynomial $p(x) = ax^3 + bx^2 + cx + d$, then,

$$\alpha + \beta + \gamma = \frac{-b}{a} = -\frac{\text{Coefficient of } x^2}{\text{Coefficient of } x^3}$$

$$\alpha\beta + \beta\gamma + \gamma\alpha = \frac{c}{a} = \frac{\text{Coefficient of } x}{\text{Coefficient of } x^3}$$

$$\alpha\beta\gamma = \frac{-d}{a} = -\frac{\text{Constant term}}{\text{Coefficient of } x^3}.$$

111 MOST PROBABLE QUESTIONS (ANALYZED & SELECTED FROM PYQs)

To Access Detailed Explanations Scan This QR Code

Note: *Questions in this section are selected based on repetitive themes and concepts from past examinations, though patterns and typologies may vary.*

1. Real Numbers

1. If the H.C.F of 360 and 64 is 8, then their L.C.M is: ***(1 M)*** **(2023)**

(*a*) 2480 (*b*) 2780 (*c*) 512 (*d*) 2880

2. 120 can be expressed as a product of its prime factors as ***(1 M)*** **(2020)**

(*a*) $5 \times 8 \times 3$ (*b*) 15×2^3
(*c*) $10 \times 2^2 \times 3$ (*d*) $5 \times 2^3 \times 3$

3. Find the H.C.F of the numbers 540 and 630, using prime factorization method. ***(2 M)*** **(2023)**

4. Prove that $4+2\sqrt{3}$ is an irrational number, given that $\sqrt{3}$ is an irrational number. ***(2 M)*** **(2023)**

5. Show that 45^n cannot end with the digit 0, *n* being a natural number. Write the prime number '*a*' which on multiplying with 45^n makes the product end with the digit 0. ***(2 M)*** **(2025)**

6. Given that $\sqrt{3}$ is an irrational number, show that $5+2\sqrt{3}$ is an irrational number. ***(3 M)*** **(2020)**

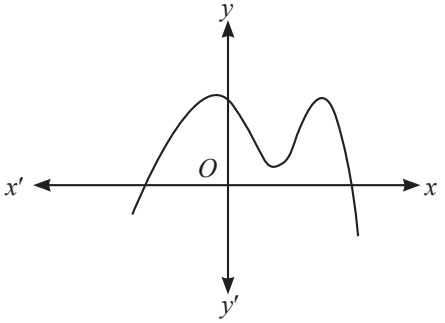
7. Find H.C.F of 44, 96 and 404 by prime factorisation method. Hence find their L.C.M. ***(3 M)*** **(2020)**

8. Given that H.C.F (156, 78) = 78, L.C.M (156, 78) is ***(1 M)*** **(2020)**

(*a*) 156 (*b*) 78 (*c*) 156×78 (*d*) 156×2

2. Polynomials

9. Graph of a polynomial $p(x)$ is given in the figure. The number of zeroes of $p(x)$ is: ***(1 M)*** **(2023)**



(*a*) 2 (*b*) 3 (*c*) 4 (*d*) 5

10. If one zero of a quadratic polynomial $(kx^2 + 3x + k)$ is 2, then the value of *k* is ***(1 M)*** **(2020)**

(*a*) $\frac{5}{6}$ (*b*) $-\frac{5}{6}$ (*c*) $\frac{6}{5}$ (*d*) $-\frac{6}{5}$

11. **Assertion (A):** Polynomial $x^2 + 4x$ has two real zeroes.

Reason (R): Zeroes of the polynomial $x^2 + ax$ ($a \neq 0$) are 0 and *a*. ***(1 M)*** **(2023)**

12. Find the value of '*k*' such that the polynomial $p(x) = 3x^2 + 2kx + x - k - 5$ has the sum of zeroes equal to half of their product. ***(2 M)*** **(2023)**

13. If α and β are the zeroes of the polynomial $f(x) = 5x^2 - 7x + 1$, then find the value of $\left(\frac{\alpha}{\beta}+\frac{\beta}{\alpha}\right)$. ***(3 M)*** **(2020)**

14. If one zero of the quadratic polynomial, $(k-1)x^2 + kx + 1$ is -4 then the value of *k* is ***(1 M)*** **(2020)**

(*a*) $-\frac{5}{4}$ (*b*) $\frac{5}{4}$ (*c*) $-\frac{4}{3}$ (*d*) $\frac{4}{3}$

15. In the quadratic polynomial $t^2 - 16$, sum of the zeroes is _____. ***(1 M)*** **(2020)**

16. Find the zeroes of the polynomial $p(x) = 6x^2 + 13x - 5$ and verify the relationship between its zeroes and the coefficients. ***(3 M)*** **(2025)**

3. Pair of Linear Equations in Two Variables

17. The value of *k* for which the equations $3x - y + 8 = 0$ and $6x + ky = -16$ represent coincident lines, is ***(1 M)*** **(2020)**

(*a*) $-\frac{1}{2}$ (*b*) $\frac{1}{2}$ (*c*) 2 (*d*) -2

18. The difference between two numbers is 26 and the larger number exceeds thrice of the smaller number by 4. Find the numbers. ***(2 M)*** **(2020)**

19. If a pair of linear equations is consistent, then the lines represented by them are ***(1 M)*** **(2020)**

(*a*) parallel (*b*) intersecting or coincident
(*c*) always coincident (*d*) always intersecting

Roll No. | | | | | | | | |

Q.P. Code **01**

Candidates must write the Q.P. Code on the title page of the answer book.

SAMPLE QUESTION PAPER- I

MATHEMATICS (BASIC)

Time allowed : 3 hours | Maximum Marks : 80

NOTE:

(i) Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.

*(ii) Please check that this question paper contains **38** questions.*

*(iii) **Please write down the Serial Number of the question in the answer-book before attempting it.***

(iv) 15 minute time has been allotted to read this question paper. The students will read the question paper only and will not write any answer on the answer-book during this period.

GENERAL INSTRUCTIONS:

Read the following instructions very carefully and follow them:

*(i) This question paper contains **38** questions. **All** questions are compulsory.*

*(ii) Question Paper is divided into 5 Sections-**Section A, B, C, D and E.***

*(iii) In **Section A question number 1 to 18 are** Multiple Choice Questions **(MCQs)** and question number **19 & 20** are Assertion-Reason based **questions of 1 mark each.***

*(iv) In **Section-B question number 21 to 25 are** Very Short Answer (VSA) type **questions of 2 marks each.***

*(v) In **Section-C question number 26 to 31 are** Short Answer (SA) type **questions carrying 3 marks each.***

*(vi) In **Section-D question number 32 to 35 are** Long Answer (LA) type **questions carrying 5 marks each.***

*(vii) In **Section-E question number 36 to 38 are** Case Study based questions **carrying 4 marks each. Internal choice is provided in 2 marks question in each case-study.***

*(viii) **There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C, 2 questions in Section D and 3 questions in Section E.***

*(ix) **Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.***

*(x) **Use of calculators is NOT allowed.***

SECTION - A

Section - A consists of Multiple Choice type questions of 1 mark each.

1. 120 can be expressed as a product of its prime factors as

(*a*) $5 \times 8 \times 3$ (*b*) 15×2^3 (*c*) $10 \times 2^2 \times 3$ (*d*) $5 \times 2^3 \times 3$

2. The sum of a rational and irrational number is:

(*a*) Rational (*b*) Irrational (*c*) both of above (*d*) None of above

3. The coefficient of x^0 in the quadratic equation $x(x - 1) - 5 = 0$ is:

(*a*) 5 (*b*) –5 (*c*) 1 (*d*) 1/2

4. For what value of k, do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines?

(*a*) $\frac{1}{2}$ (*b*) $-\frac{1}{2}$ (*c*) 2 (*d*) –2

5. The discriminant of the quadratic equation $4x^2 - 6x + 3 = 0$

(*a*) 12 (*b*) 84 (*c*) $2\sqrt{3}$ (*d*) –12

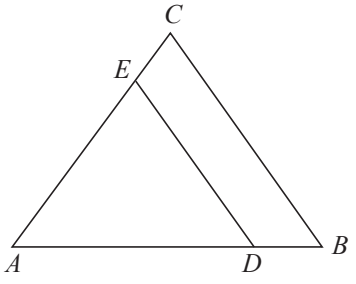
6. The distance between the points (3, –2) and (–3, 2) is

(*a*) $\sqrt{52}$ units (*b*) $4\sqrt{10}$ units (*c*) $2\sqrt{10}$ units (*d*) 40 units

7. Which of the following is NOT a similarity criterion

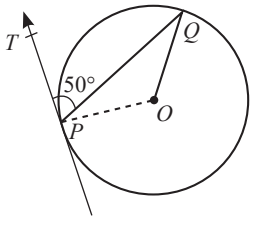
(*a*) AA (*b*) SAS (*c*) AAA (*d*) RHS

8. In the figure given below $DE \parallel BC$. If $AD = x$, $DB = x - 2$, $AE = x + 2$ and $EC = x - 1$, the value of x is:



(*a*) 4 (*b*) 16 (*c*) 2 (*d*) 8

9. In Fig., O is the centre of circle. PQ is a chord and PT is tangent at P which makes an angle of 50° with PQ. $\angle POQ$ is



(*a*) 130° (*b*) 90° (*c*) 100° (*d*) 75°

10. $(\sin 30° + \cos 30°) - (\sin 60° + \cos 60°)$

(*a*) –1 (*b*) 0 (*c*) 1 (*d*) $\frac{1}{2}$

11. The string of a kite in air is 50 m long and it makes an angle of 60° with the horizontal. Assuming the string to be straight, the height of the kite from the ground is:

(*a*) $50\sqrt{3}$ m (*b*) $\frac{100}{\sqrt{3}}$ m (*c*) $\frac{50}{\sqrt{3}}$ m (*d*) $25\sqrt{3}$ m

SECTION - D

Section - D consists of Long Answer (LA) type questions of 5 Marks each.

32. (*a*) Solve for x: $\frac{1}{x+1}+\frac{3}{5x+1}=\frac{5}{x+4}, x \neq -1, -\frac{1}{5}, -4$

OR

(*b*) Rashmi can row her boat at a speed of 5 km/h in still water. If she takes 1 hour more to row the boat 5.25 km upstream than to return downstream, find the speed of the boat in upstream.

33. If AD and PM are medians of triangles ABC and PQR, respectively where $\Delta ABC \sim \Delta PQR$, prove that $\frac{AB}{PQ}=\frac{AD}{PM}$.

34. (*a*) A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

OR

(*b*) A solid toy is in the form of a hemisphere surmounted by a right circular cone. The height of the cone is 2 cm, and the diameter of the base is 4 cm. Determine the volume of the toy. If a right circular cylinder circumscribes the toy, find the difference between the volumes of the cylinder and the toy. (Take $\pi = 3.14$)

35. The following distribution gives the state-wise teacher-student ratio in higher secondary schools of India. Find the mode and mean of this data. Interpret the two measures.

No of Students per teacher	Number of states / U.T
15-20	3
20-25	8
25-30	9
30-35	10
35-40	3
40-45	0
45-50	0
50-55	2

SECTION - E

Section - E consists of 3 Case Study Based questions of 4 marks each.

36. Manufacturing is emerging as an integral pillar in the country's economic growth, thanks to the performance of key sectors like automotive, engineering, chemicals, pharmaceuticals, and consumer durables. India is competitive manufacturing location due to the low cost of manpower and strong technical and engineering capabilities contributing to higher quality production runs.

A company produces shoes and sells it at a price that increases by ₹10 every month. In the first month, the company sold 500 units of the product at a price of ₹500 per unit.

SAMPLE QUESTION PAPER-I

(Explanations)

1. (*d*) Let's find the prime factors of 120:
$120 = 2 \times 60 = 2 \times 2 \times 30$
$= 2 \times 2 \times 2 \times 15 = 2 \times 2 \times 2 \times 3 \times 5$
So, the prime factorization of 120 is $2^3 \times 3 \times 5$.
(1 M)

2. (*b*) Let a be a rational number and b be an irrational number. We'll choose $a = \frac{1}{2}$ and $b = \sqrt{2}$ for this example.

Now, the sum of a and b is $\frac{1}{2} + \sqrt{2}$ which is an irrational number. ***(1 M)***

3. (*b*) We have, $x(x - 1) - 5 = 0 \Rightarrow x^2 - x - 5 = 0$. The coefficient of x^0 means constant term, i.e. –5 ***(1 M)***

4. (*c*) $3x - y = -8$ … (*i*)
$6x - ky = -16$ … (*ii*)
For coincident lines,
$$\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} \Rightarrow \frac{3}{6} = \frac{-1}{-k} = \frac{-8}{-16}$$
On solving, we get, $k = 2$ ***(1 M)***

5. (*d*) $D = b^2 - 4ac$
Where $a = 4$, $b = -6$, and $c = 3$.
Substitute these values into the formula:
$D = (-6)^2 - 4 \times 4 \times 3$
$\Rightarrow D = 36 - 48$
$\Rightarrow D = -12$ ***(1 M)***

6. (*a*) Distance $= \sqrt{(3+3)^2 + (-2-2)^2}$
$= \sqrt{36+16} = \sqrt{52}$ units ***(1 M)***

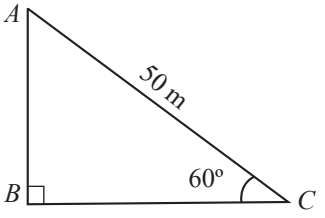
7. (*d*) RHS is not a similarity criterion, it is a congruence criterion. ***(1 M)***

8. (*a*) In ΔABC, $DE \parallel BC$
$$\therefore \frac{AD}{DB} = \frac{AE}{EC} \Rightarrow \frac{x}{2x-2} = \frac{x+2}{2x+1} \Rightarrow x = 4$$ ***(1 M)***

9. (*c*) Radius from the centre makes an angle of 90° at the point where the tangent meets the circle.
$\angle OPQ = (90° - 50°) = 40°$
$\angle OPQ = \angle OQP = 40°$ (Triangle OPQ is isosceles)
By Angle sum property of triangle we get,
$\angle POQ = (180° - 80°) = 100°$ ***(1 M)***

10. (*b*) $(\sin 30° + \cos 30°) - (\sin 60° + \cos 60°)$
$$= \frac{1}{2} + \frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} - \frac{1}{2} = 0$$ ***(1 M)***

11. (*d*) Given,
Length of string (AC) of kite= 50 m
Angle of elevation = 60°



Consider ΔABC, as shown in the figure:
$$\sin 60° = \frac{AB}{AC} \Rightarrow \frac{\sqrt{3}}{2} = \frac{AB}{50}$$
$$\Rightarrow \frac{50\sqrt{3}}{2} = AB \Rightarrow AB = 25\sqrt{3}\text{ m}$$
Hence, the height of the kite is $25\sqrt{3}$ m. ***(1 M)***

12. (*c*) $$\cos^2\theta - \frac{1}{1+\tan^2\theta} = \cos^2\theta - \frac{1}{1+\frac{\sin^2\theta}{\cos^2\theta}}$$
$$= \cos^2\theta - \frac{1}{\frac{\sin^2\theta+\cos^2\theta}{\cos^2\theta}} = \cos^2\theta - \frac{\cos^2\theta}{\sin^2\theta+\cos^2\theta}$$
$= \cos^2\theta - \cos^2\theta$ $[\because \sin^2\theta + \cos^2\theta = 1]$
$= 0$ ***(1 M)***

13. (*c*) It is given that, r is radius and h is the height of the cone.
Therefore, slant height (l) = $\sqrt{h^2 + r^2}$
$\Rightarrow l^2 = h^2 + r^2$
$\Rightarrow l = \left(h^2 + r^2\right)^{1/2}$ ***(1 M)***

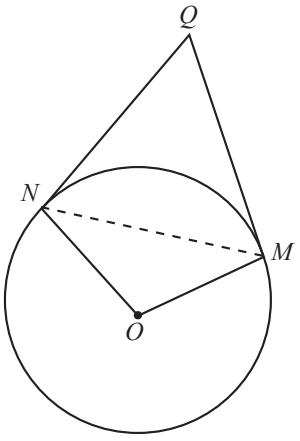
14. (*d*) We know that Area of the sector = $\frac{\theta}{360°} \times \pi r^2$
$$= \frac{p}{360°} \times \pi R^2 = \frac{p}{720°} \times 2\pi R^2$$ ***(1 M)***

15. (*b*) Total number of outcomes = 52
No. of face card = 12
$$P\text{ (getting a face card)} = \frac{12}{52} = \frac{3}{13}$$ ***(1 M)***

29. Given: A circle with centre O. Tangents NQ and MQ drawn from external point Q.

To prove: $\angle MQN + \angle NOM = 180°$.

Construction: Join NM ***(½ M)***



(½ M)

Proof: It is clear from the above diagram that the line segments OM and QM are perpendicular to each other as tangent is perpendicular to radius

Therefore, $\angle OMQ = 90°$ ***(½ M)***

Similarly, the line segments $ON \perp QN$ and so, $\angle ONQ = 90°$ ***(½ M)***

Now, in the quadrilateral $OMQN$,

$\angle MQN + \angle OMQ + \angle QNO + \angle NOM = 360°$ (since the sum of all interior angles of a quadrilateral is 360°)

(½ M)

$\Rightarrow \angle MQN + 180° + \angle NOM = 360°$

So, $\angle MQN + \angle NOM = 180°$ ***(½ M)***

Hence proved.

30. (*a*) L.H.S $= \dfrac{2\cos^3\theta - \cos\theta}{\sin\theta - 2\sin^3\theta} = \dfrac{\cos\theta(2\cos^2\theta - 1)}{\sin\theta(1 - 2\sin^2\theta)}$ ***(1 M)***

$= \dfrac{\cos\theta(1 - 2\sin^2\theta)}{\sin\theta(1 - 2\sin^2\theta)}$ ***(½ M)***

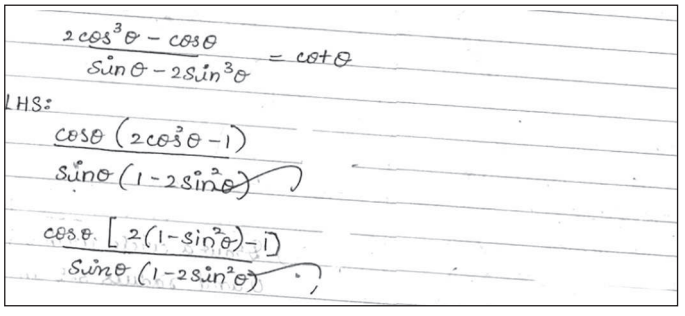
$(\because \cos^2\theta = 1 - \sin^2\theta)$ ***(½ M)***

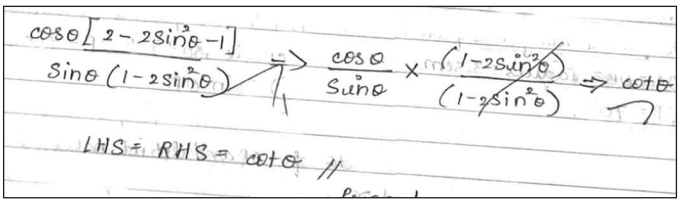
$= \cot\theta$ = R.H.S.

$\therefore$ L.H.S. = R.H.S.

Hence Proved ***(1 M)***

Topper's Explanation **(*CBSE 2020*)**





OR

(*b*) L.H.S. $= \dfrac{\sin A - 2\sin^3 A}{2\cos^3 A - \cos A}$

$= \dfrac{\sin A}{\cos A}\left(\dfrac{1 - 2\sin^2 A}{2\cos^2 A - 1}\right)$ ***(1 M)***

$= \dfrac{\sin A}{\cos A} \cdot \dfrac{\{1 - 2(1 - \cos^2 A)\}}{(2\cos^2 A - 1)}$ ***(1 M)***

$= \tan A\left(\dfrac{1 - 2 + 2\cos^2 A}{2\cos^2 A - 1}\right) = \tan A\left(\dfrac{2\cos^2 A - 1}{2\cos^2 A - 1}\right)$

$= \tan A$ = R.H.S

L.H.S = R.H.S ***(1 M)***

Hence proved.

Nailing the Right Answer

In this type of problem, students should always remember to form a formula by taking the common trigonometric function.

31. Apoorv throws two dice once.

So, total number of outcomes = 36

Number of outcomes for getting product 36 = 1 i.e., (6 × 6)

$\therefore$ Probability for Apoorv $= \dfrac{1}{36}$ ***(1 M)***

Also, Peehu throws one die

So, total number of outcomes = 6

Number of outcomes for getting square 36 = 1

$\therefore$ Probability for Peehu $= \dfrac{1}{6} = \dfrac{6}{36}$ ***(1 M)***

Hence, Peehu has a better chance of getting the number 36. ***(1 M)***

32. (*a*) Given, $\dfrac{1}{x+1} + \dfrac{3}{5x+1} = \dfrac{5}{x+4}$

$\Rightarrow \dfrac{1}{x+1} - \dfrac{5}{x+4} = \dfrac{-3}{5x+1} \Rightarrow \dfrac{(x+4) - 5(x+1)}{(x+1)(x+4)} = \dfrac{-3}{5x+1}$ ***(½ M)***

$\Rightarrow \dfrac{x + 4 - 5x - 5}{x^2 + 5x + 4} = \dfrac{-3}{5x+1} \Rightarrow \dfrac{(-4x - 1)}{x^2 + 5x + 4} = \dfrac{-3}{5x+1}$ ***(½ M)***

CBSE SAMPLE QUESTION PAPER

(Issued by CBSE on 30th July, 2025)

Class-X Session: 2025-26

MATHEMATICS BASIC (241)

Time allowed : 3 hours | Maximum Marks : 80

GENERAL INSTRUCTIONS:

Read the following instructions carefully and follow them:

(i) This question paper contains 38 questions. All Questions are compulsory.

(ii) This Question Paper is divided into 5 Sections A, B, C, D and E.

(iii) In Section A, Question numbers 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.

(iv) In Section B, Question numbers 21-25 are very short answer (VSA) type questions, carrying 02 marks each.

(v) In Section C, Question numbers 26-31 are short answer (SA) type questions, carrying 03 marks each.

(vi) In Section D, Question numbers 32-35 are long answer (LA) type questions, carrying 05 marks each.

(vii) In Section E, Question numbers 36-38 are case study-based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.

(viii) There is no overall choice. However, an internal choice in 2 questions of Section B, 2 questions of Section C and 2 questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.

(xi) Draw neat and clean figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

(x) Use of calculators is not allowed.

SECTION - A

Section A consists of 20 questions of 1 mark each.

1. The exponent of 3 in the prime factorization of 2025 is **(1 M)**

(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4

Sol. (*d*) As, $2025 = 3^4 \times 5^2$

So, the exponent of 3 in the prime factorization of 2025 is 4. **(1 M)**

2. If $2024x + 2025y = 1$; $2025x + 2024y = -1$, then $x - y =$ **(1 M)**

(*a*) 0 (*b*) -2 (*c*) 2 (*d*) -1

Sol. (*b*) On subtracting first equation from second equation, we get

$2025x + 2024y - 2024x - 2025y = -1 - 1 \Rightarrow (x - y) = -2$ **(1 M)**

3. The number of polynomials having -2 and 5 as its zeroes is **(1 M)**

(*a*) one (*b*) two (*c*) three (*d*) Infinitely many

Sol. (*d*) As, $f(x) = k(x + 2)(x - 5) \quad \Rightarrow f(x) = k(x^2 - 3x - 10)\ k \neq 0$

Since k can be any real number. So, there are Infinitely many such polynomials. **(1 M)**

4. Which of the following is not a quadratic equation? **(1 M)**

(*a*) $(x + 2)^2 = 2(x + 3)$ (*b*) $x^2 + 3x = (-1)(1 - 3x^2)$ (*c*) $(x+2)(x-1) = x^2 - 2x - 3$ (*d*) $x^3 - x^2 + 2x + 1 = (x + 1)^3$

Sol. (*c*) On simplification, given equations reduce to

(*a*) $x^2 + 2x - 2 = 0$ (Quadratic Equation)

(*b*) $2x^2 - 3x - 1 = 0$ (Quadratic Equation)

(*c*) $3x + 1 = 0$ (NOT a Quadratic Equation)

(*d*) $4x^2 + x = 0$ (Quadratic Equation) **(*1 M*)**

5. The value of x for which $2x$, $(x + 10)$ and $(3x + 2)$ are the three consecutive terms of an AP is **(*1 M*)**

(*a*) 6 (*b*) -6 (*c*) -2 (*d*) 2

Sol. (*a*) As, $2(x + 10) = (3x + 2) + 2x \Rightarrow x = 6$ **(*1 M*)**

6. If $1 + 2 + 3 + 4 + ... + 50 = 25k$, then $k =$ **(*1 M*)**

(*a*) 50 (*b*) 51 (*c*) 49 (*d*) 26

Sol. (*b*) As, $\frac{50(51)}{2} = 25k \Rightarrow k = 51$ **(*1 M*)**

7. The distance between the points (cos30°, sin30°) and (cos60°, – sin 60°) is **(*1 M*)**

(*a*) 0 unit (*b*) $\sqrt{3}$ units (*c*) 1 unit (*d*) $\sqrt{2}$ units

Sol. (*d*) Distance between the given points = $\sqrt{\left(\frac{1}{2} - \frac{\sqrt{3}}{2}\right)^2 + \left(\frac{1}{2} + \frac{\sqrt{3}}{2}\right)^2} = \sqrt{2}$ units **(*1 M*)**

8. The coordinates of the point which is mirror image of the point $(-3, 5)$ about x-axis are **(*1 M*)**

(*a*) (3, 5) (*b*) (3, −5) (*c*) (−3, −5) (*d*) (−3, 5)

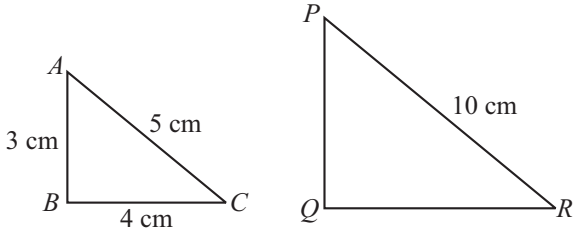
Sol. (*c*) We know that, for the coordinates of a mirror image of a point in x-axis, abscissa remains the same and ordinate will be of opposite sign of the ordinate of given point. So, the Mirror image of the point (–3, 5) about x-axis is (–3, –5). **(*1 M*)**

9. If in ΔABC and ΔDEF, $\frac{AB}{EF} = \frac{AC}{DE}$ then they will be similar when **(*1 M*)**

(*a*) $\angle A = \angle D$ (*b*) $\angle A = \angle E$ (*c*) $\angle C = \angle F$ (*d*) $\angle B = \angle E$

Sol. (*b*) As, $\Delta ABC \sim \Delta EFD \Rightarrow \angle A = \angle E$ **(*1 M*)**

10. If $\Delta ABC \sim \Delta PQR$, then perimeter of the triangle PQR (in cm) is **(*1 M*)**



(*a*) 12 (*b*) 24 (*c*) 18 (*d*) 20

Sol. (*b*) As, $\Delta ABC \sim \Delta PQR \Rightarrow \frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR} = \frac{1}{2} \Rightarrow PQ = 6$ cm, $QR = 8$ cm

Perimeter of the triangle PQR (in cm) = 6 + 8 +10 = 24 cm **(*1 M*)**

CBSE SAMPLE QUESTION PAPER

(Issued by CBSE on 30th July, 2025)

Class-X Session: 2025-26

MATHEMATICS BASIC (241)

Time allowed : 3 hours | Maximum Marks : 80

GENERAL INSTRUCTIONS:

Read the following instructions carefully and follow them:

(i) This question paper contains 38 questions. All Questions are compulsory.

(ii) This Question Paper is divided into 5 Sections A, B, C, D and E.

(iii) In Section A, Question numbers 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.

(iv) In Section B, Question numbers 21-25 are very short answer (VSA) type questions, carrying 02 marks each.

(v) In Section C, Question numbers 26-31 are short answer (SA) type questions, carrying 03 marks each.

(vi) In Section D, Question numbers 32-35 are long answer (LA) type questions, carrying 05 marks each.

(vii) In Section E, Question numbers 36-38 are case study-based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.

(viii) There is no overall choice. However, an internal choice in 2 questions of Section B, 2 questions of Section C and 2 questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.

(xi) Draw neat and clean figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

(x) Use of calculators is not allowed.

SECTION - A

Section A consists of 20 questions of 1 mark each.

1. The exponent of 3 in the prime factorization of 2025 is **(1 M)**

(*a*) 1 (*b*) 2 (*c*) 3 (*d*) 4

Sol. (*d*) As, $2025 = 3^4 \times 5^2$

So, the exponent of 3 in the prime factorization of 2025 is 4. **(1 M)**

2. If $2024x + 2025y = 1$; $2025x + 2024y = -1$, then $x - y =$ **(1 M)**

(*a*) 0 (*b*) -2 (*c*) 2 (*d*) -1

Sol. (*b*) On subtracting first equation from second equation, we get

$2025x + 2024y - 2024x - 2025y = -1 - 1 \Rightarrow (x - y) = -2$ **(1 M)**

3. The number of polynomials having -2 and 5 as its zeroes is **(1 M)**

(*a*) one (*b*) two (*c*) three (*d*) Infinitely many

Sol. (*d*) As, $f(x) = k(x + 2)(x - 5) \quad \Rightarrow f(x) = k(x^2 - 3x - 10)\ k \neq 0$

Since k can be any real number. So, there are Infinitely many such polynomials. **(1 M)**

4. Which of the following is not a quadratic equation? **(1 M)**

(*a*) $(x + 2)^2 = 2(x + 3)$ (*b*) $x^2 + 3x = (-1)(1 - 3x^2)$ (*c*) $(x+2)(x-1) = x^2 - 2x - 3$ (*d*) $x^3 - x^2 + 2x + 1 = (x + 1)^3$

Sol. (*c*) On simplification, given equations reduce to

(*a*) $x^2 + 2x - 2 = 0$ (Quadratic Equation)

(*b*) $2x^2 - 3x - 1 = 0$ (Quadratic Equation)

(*c*) $3x + 1 = 0$ (NOT a Quadratic Equation)

(*d*) $4x^2 + x = 0$ (Quadratic Equation) **(*1 M*)**

5. The value of x for which $2x$, $(x + 10)$ and $(3x + 2)$ are the three consecutive terms of an AP is **(*1 M*)**

(*a*) 6 (*b*) -6 (*c*) -2 (*d*) 2

Sol. (*a*) As, $2(x + 10) = (3x + 2) + 2x \Rightarrow x = 6$ **(*1 M*)**

6. If $1 + 2 + 3 + 4 + ... + 50 = 25k$, then $k =$ **(*1 M*)**

(*a*) 50 (*b*) 51 (*c*) 49 (*d*) 26

Sol. (*b*) As, $\frac{50(51)}{2} = 25k \Rightarrow k = 51$ **(*1 M*)**

7. The distance between the points (cos30°, sin30°) and (cos60°, – sin 60°) is **(*1 M*)**

(*a*) 0 unit (*b*) $\sqrt{3}$ units (*c*) 1 unit (*d*) $\sqrt{2}$ units

Sol. (*d*) Distance between the given points = $\sqrt{\left(\frac{1}{2} - \frac{\sqrt{3}}{2}\right)^2 + \left(\frac{1}{2} + \frac{\sqrt{3}}{2}\right)^2} = \sqrt{2}$ units **(*1 M*)**

8. The coordinates of the point which is mirror image of the point $(-3, 5)$ about x-axis are **(*1 M*)**

(*a*) (3, 5) (*b*) (3, −5) (*c*) (−3, −5) (*d*) (−3, 5)

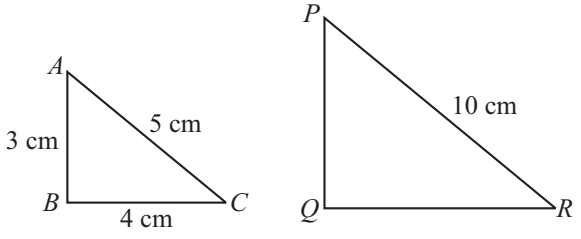
Sol. (*c*) We know that, for the coordinates of a mirror image of a point in x-axis, abscissa remains the same and ordinate will be of opposite sign of the ordinate of given point. So, the Mirror image of the point (–3, 5) about x-axis is (–3, –5). **(*1 M*)**

9. If in ΔABC and ΔDEF, $\frac{AB}{EF} = \frac{AC}{DE}$ then they will be similar when **(*1 M*)**

(*a*) $\angle A = \angle D$ (*b*) $\angle A = \angle E$ (*c*) $\angle C = \angle F$ (*d*) $\angle B = \angle E$

Sol. (*b*) As, $\Delta ABC \sim \Delta EFD \Rightarrow \angle A = \angle E$ **(*1 M*)**

10. If $\Delta ABC \sim \Delta PQR$, then perimeter of the triangle PQR (in cm) is **(*1 M*)**



(*a*) 12 (*b*) 24 (*c*) 18 (*d*) 20

Sol. (*b*) As, $\Delta ABC \sim \Delta PQR \Rightarrow \frac{AB}{PQ} = \frac{BC}{QR} = \frac{AC}{PR} = \frac{1}{2} \Rightarrow PQ = 6$ cm, $QR = 8$ cm

Perimeter of the triangle PQR (in cm) = 6 + 8 +10 = 24 cm **(*1 M*)**

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