

SAMPLE QUESTION PAPER

Class X Session 2026-27

MATHEMATICS

TIME: 3 hours

MAX.MARKS:

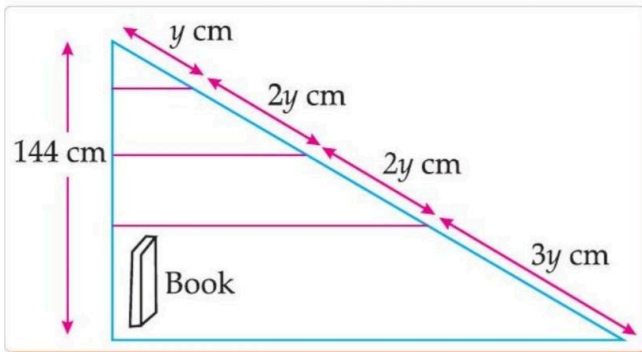
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General Instructions:

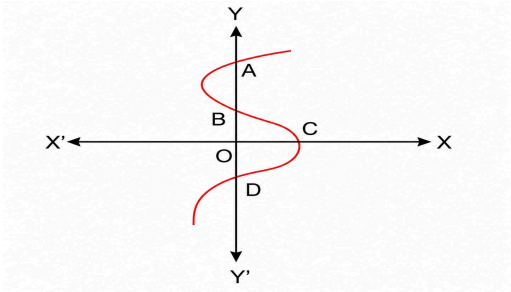
Read the following instructions carefully and follow them:

1. This question paper contains 38 questions.
2. This Question Paper is divided into 5 Sections A, B,C,D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 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.
8. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Questions of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = 22/7$ wherever required if not stated.
11. Use of calculators is not allowed.

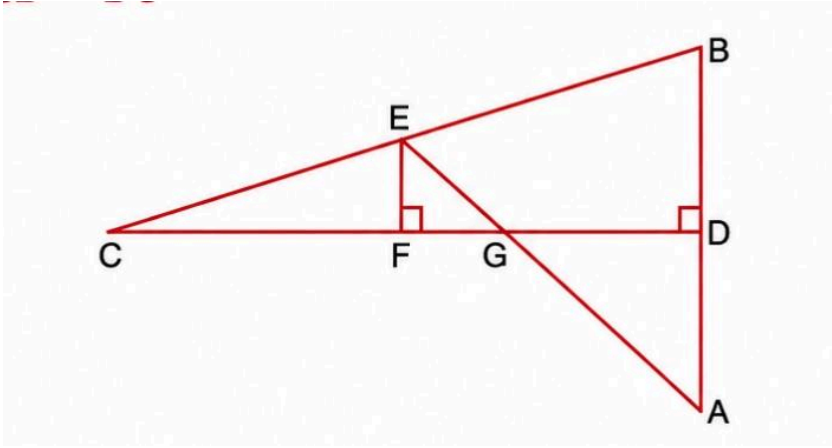
Section A		
	Section A consists of 20 questions of 1 mark each.	
1.	An irrational number between $\sqrt{2}$ and $\sqrt{3}$ is: (A) $\sqrt[4]{6}$ (B) 1.5 (C) $\sqrt{5}$ (D) $\sqrt{6}$	1
2.	A quadratic polynomial whose sum and product of zeroes are $\frac{21}{8}$ and $\frac{5}{16}$ respectively, is: (A) $16x^2 - 42x + 5$ (B) $8x^2 - 42x + 5$ (C) $16x^2 - 21x + 5$ (D) $8x^2 - 21x + 5$	1

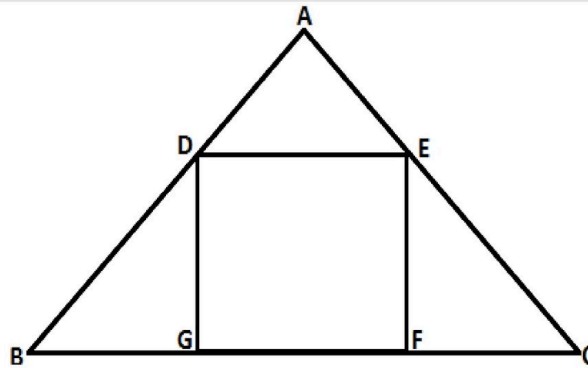
3.	Harsh correctly solved a pair of linear equations in two variables and found their only point of intersection as (3,-2). One of the lines was $x - y = 5$. Which of the following could have been the other line? (I) $3x - 3y = 15$ (II) $2x - 3y = 12$ (III) $2x - 3y = 14$ (A) Only I (B) Only II (C) Only I and II (D) Only II and III	1
4.	Leela has a triangular cabinet that fits under his staircase. There are four parallel shelves as shown below:  (Note: the figure is not to scale) The total height of the cabinet is 144 cm. The maximum height of a book that can stand upright on the bottom-most shelf is: (A) 18 cm (B) 36 cm (C) 54 cm (D) 86.4 cm	1
5.	If the zeroes of quadratic polynomial $ax^2 + bx + c$, $c \neq 0$ are equal, then (A) c and b have opposite signs. (B) c and a have opposite signs. (C) c and b have the same signs. (D) c and a have the same signs.	1
6.	If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are not parallel, then k has to be (A) $\frac{15}{6}$ (B) $\neq \frac{15}{6}$ (C) any rational number (D) any rational number having 4 in denominator	1
7.	ABCD is a trapezium with $AD \parallel BC$ and $AD = 4$ cm. If the diagonals AC and BD intersect each other at O such that $\frac{AO}{OC} = \frac{DO}{OB} = \frac{1}{2}$, then $BC =$	1

	(A) 6 cm (B) 8 cm (C) 7 cm (D) 9 cm	
8.	The pair of equations $ax + 2y = 9$ and $3x + by = 18$ represent parallel lines, where a, b are integers, if (A) $a=b$ (B) $3a=2b$ (C) $2a=3b$ (D) $ab=6$	1
9.	The sum of the exponents of the prime factors in the prime factorization of 4004 is: (A) 5 (B) 4 (C) 3 (D) 2	1
10.	The distance between the mirror image of point P(2,3) in y-axis and mirror image of point Q(5,3) in x-axis is : (A) $2\sqrt{2}$ units (B) $4\sqrt{2}$ units (C) $8\sqrt{2}$ units (D) $10\sqrt{2}$ units	1
11.	A line intersects the y-axis and x-axis at the points P and Q respectively. If (2,-5) is the mid-point of PQ then the coordinates of P and Q are, respectively: (A) (0,-5) and (2,0) (B) (0,10) and (-4,0) (C) (0,4) and (-10,0) (D) (0,-10) and (4,0)	1
12.	If $x = p \cos^3 \alpha$ and $y = p \sin^3 \alpha$, the value of $\left(\frac{x}{p}\right)^{\frac{2}{3}} + \left(\frac{y}{p}\right)^{\frac{2}{3}}$ is: (A) 1 (B) 2 (C) p (D) q	1
13.	If $x \tan 45^\circ \cdot \cos 60^\circ = \sin 60^\circ \cdot \cot 60^\circ$ then x is equal to : (A) 1 (B) $\frac{1}{\sqrt{3}}$ (C) $\frac{1}{2}$ (D) $\sqrt{2}$	1
14.	A(-4,5) and C(8,2) are the opposite vertices of a parallelogram ABCD. Its diagonals intersect each other at P(a,b). The relation between 'a' and 'b' is: (A) $b=a-1.5$ (B) $b=a+1.5$ (C) $b=a-4.5$ (D) $b=a+4.5$	1
15.	The ratio of the sum and product of the roots of the quadratic equation $5x^2 - 6x + 21 = 0$ is (A) 5:21 (B) 2:7 (C) 21:5 (D) 7:2	1
16.	If the equation $x^2 + 4x + k = 0$ has real and distinct roots then: (A) $k > 4$ (B) $k < 4$ (C) $k = 4$ (D) $k \geq 4$	1
17.	A card is drawn at random from a pack of 52 playing cards. The probability of getting a card which is either red or jack is written as $\frac{x+2}{3x}$ then the value of x is:	1

	(A) $\frac{13}{4}$ (B) 4 (C) $\frac{4}{13}$ (D) $\frac{1}{4}$	
18.	If two roots of the quadratic equation $2x^2 + ax + b = 0$ are reciprocal of each other then b is equal to: (A) 2 (B) -2 (C) $\frac{1}{2}$ (D) $-\frac{1}{2}$	1
	DIRECTION: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) B) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) C) Assertion (A) is true but reason (R) is false. D) Assertion (A) is false but reason (R) is true.	
19.	 Assertion (A): In the given figure, the graph of a polynomial $p(x)$ is shown. The number of zeroes of $p(x)$ is 1. Reason (R) : The zero of the polynomial $p(x)$ is the x-coordinate of the point where the graph of $y=p(x)$ intersects the x-axis.	1
20.	Assertion (A): The probability that a leap year has 53 Sundays is $\frac{2}{7}$. Reason (R) : The probability that a non-leap year has 53 Sundays is $\frac{5}{7}$.	1
Section -B		
	Section B consists of 5 questions of 2 marks each.	
21.	If α and β are the zeroes of the polynomial $p(y) = 5y^2 - 7y + 1$, then find the value of $\alpha^2\beta + \alpha\beta^2$	2

22.	A box contains cards numbered 11 to 123. A card is drawn at random from the box. Find the probability that the number on the drawn card is (i) a square number (ii) a multiple of 7 OR One number is selected from the numbers 2,3,3,5,5,5,7,9,20 at random. Find the probability that the selected number is equal to the median of the given numbers.	2
23.	Solve the following system of linear equations: $ax + by = a - b$ $bx - ay = a + b$	2
24.	The larger of two supplementary angles exceeds the smaller by 18°. Find the angles. OR Solve for x: $\frac{x+3}{x+2} = \frac{3x-7}{2x-3}$, $x \neq -2, \frac{3}{2}$	2
25.	A(5,1) , B(1,5) and C(-3,-1) are the vertices of $\triangle ABC$. Find the length of median AD.	2
	Section -C	
	Section C consists of 6 questions of 3 marks each	
26.	(A). If $\sin \theta + \cos \theta = \sqrt{2}$, then prove that $\tan \theta + \cot \theta = 2$ OR (B). If $\tan A = \sqrt{2} - 1$, show that $\sin A \cdot \cos A = \frac{\sqrt{2}}{4}$	3
27.	Prove that $\sqrt{5} + 3$ is an irrational number. Given that $\sqrt{5}$ is an irrational number.	3
28.	(A). The monthly income of Aryan and Babban are in the ratio 3:4 and their monthly expenditures are in the ratio 5:7. If each saves ₹15,000 per month, find their monthly incomes. OR (B). Solve the following system of equations graphically: $2x + y = 6$, $2x - y - 2 = 0$. Find the area of the triangle so formed by two lines and x-axis.	3
29.	How many positive three-digit integers have the hundredth digit 8 and unit's digit 5? Find the probability of selecting one such number out of all three digit numbers.	3

30.	The line segment joining the points A(2,1) and B(5,-8) is trisected by points P and Q, where P is nearer to A. If the point P also lies on the line $2x - y + k = 0$, find the value of k .	3
31.	In the given figure, CD is the perpendicular bisector of AB. EF is perpendicular to CD. AE intersects CD at G. Prove that $\frac{CF}{CD} = \frac{FG}{DG}$. 	3
Section -D		
Section D consists of 4 questions of 5 marks each		
32.	(A). Some students planned for a picnic and the total budget for a picnic was rupees 1800. But four students failed to go, thus the cost for each member increased by rupees 5. Find how many students attended the picnic and how much it will cost for each student ? OR (B). If -4 is the root of quadratic equation $3x^2 + px - 8 = 0$ and the quadratic equation $px^2 + 3px - k = 0$ has equal roots, then find the value of k.	5
33.	(A). In figure DEFG is a square and angle BAC=90°. Prove that :	5



- (i). $\Delta AGF \sim \Delta DBG$
(ii). $\Delta AGF \sim \Delta EFC$
(iii). $\Delta DBG \sim \Delta EFC$
(iv). $DE^2 = BD \times EC$.

OR

(B). State and Prove Basic Proportionality Theorem.

Using the above theorem find the value of x for which $DE \parallel AB$ in the figure.

34. Prove that: $\frac{1 + \operatorname{cosec} \theta - \cot \theta}{1 + \operatorname{cosec} \theta + \cot \theta} = \operatorname{cosec} \theta - \cot \theta$

5

35. A part of monthly hostel charges in a college hostel are fixed and the remaining depends on the number of days one has taken food in the mess. When a student A takes food for 25 days he has to pay ₹ 4500, whereas a student B who takes food for 30 days has to pay ₹ 5200. Find the fixed charges per month and the cost of food per day.

5

Section E

Section E consists of 3 case study based questions of 4 marks each.

36. Addy works as a librarian in Frank Anthony Convent School in Bhopal. He ordered books of English, Hindi and Mathematics. He received 96 English books, 240 Hindi books and 336 Maths books. He wishes to arrange these books in stacks such that each stack consists of the books on only one subject and the number of books in each stack is the same. He also wishes to keep the number of stacks minimum.



(i). Find the number of books in each stack.

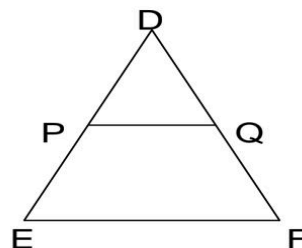
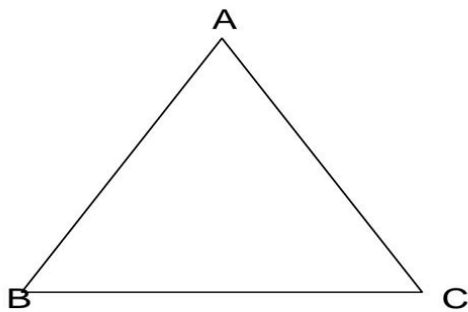
(ii). Find the total number of stacks formed.

(iii) (A). If the thickness of each English book is 3cm, then find the height of each stack of English books.

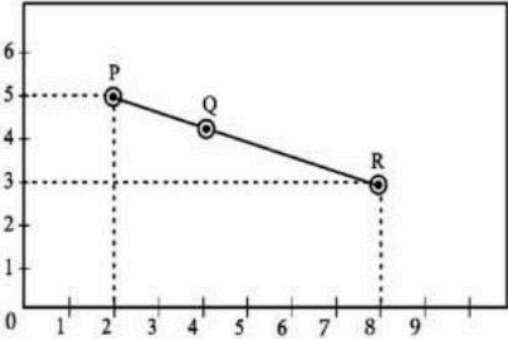
OR

(iii) (B). If each Hindi book weighs 1.5 kg, then find the weight of books in a stack of Hindi books.

37.



Triangle is a very popular shape used in interior designing. The picture given above

	shows a cabinet designed by a famous interior designer. Here the largest triangle is represented by $\triangle ABC$ and smallest one with shelf is represented by $\triangle DEF$. PQ is parallel to EF. (i) Show that $\triangle DPQ \sim \triangle DEF$. (ii) If $DP=50$ cm and $PE=70$ cm, then find $\frac{PQ}{EF}$ (iii) (A). If $2AB=5DE$ and $\triangle ABC \sim \triangle DEF$ then show that $\frac{\text{perimeter of } \triangle ABC}{\text{perimeter of } \triangle DEF}$ is constant. OR (iii) (B). If AM and DN are medians of triangle ABC and DEF respectively then prove that $\triangle ABM \sim \triangle DEN$.	1 1 2
38.	A group of Class x students went on an excursion during vacations. There were three different slides and three friends Aditi, Neeraj and Kunal were sliding in the three slides. The position of the three friends shown by P, Q and R in different slides are given below:   Consider O as the origin and answer the following questions: (i) Find the coordinates of the point Q which divides the line segment PR in the ratio 1:2. (ii) Find the distance PR. (iii) (A). Find the coordinates of a point on the x-axis which is at equal distance from P and Q. OR	1 1 2

	(iii) (B). If we shift the origin by 2 units towards right and 1 unit towards North, then find the coordinates of point R.	
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