



INDIAN SCHOOL SALALAH

FIRST TERM EXAMINATION – SEPTEMBER 2026



Roll No.

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Class: X

MATHEMATICS (041)

Date: 14.09.2026

Time: 3 hours

Maximum Marks: 80

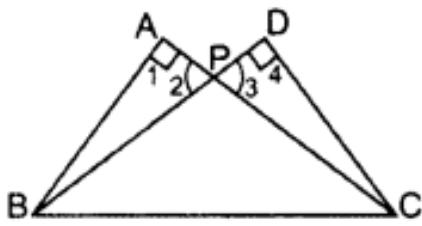
General Instructions:

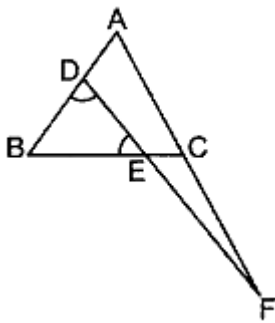
- This Question paper contains 38 questions. All questions are compulsory.
- This Question paper is divided into five Sections - A, B, C, D and E.
- In Section A, Questions no. 1 to 18 are multiple choice questions (MCQs) with only one correct option and Questions no. 19 and 20 are Assertion-Reason based questions of 1 mark each.
- In Section B, Questions no. 21 to 25 are Very Short Answer (VSA)-type questions, carrying 2 marks each.
- In Section C, Questions no. 26 to 31 are Short Answer (SA)-type questions, carrying 3 marks each.
- In Section D, Questions no. 32 to 35 are Long Answer (LA)-type questions, carrying 5 marks each.
- In Section E, Questions no. 36 to 38 are Case study-based questions, carrying 4 marks each.
- There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 3 questions in Section C, 2 questions in Section D and one subpart each in 2 questions of Section E.
- Use of calculator is not allowed.

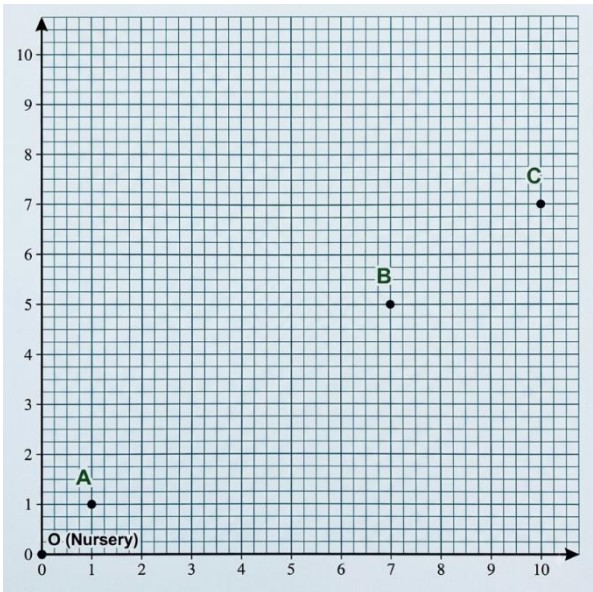
NO	SECTION A	MARKS
1	Two coins are tossed simultaneously. The probability of getting at least one head is: (a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) $\frac{3}{4}$ (d) 1	1
2	If two positive integers p and q can be expressed as $p = a^2b^3$ and $q = a^3b$, where a, b are prime numbers, then LCM (p, q) is: (a) ab (b) a^2b (c) a^3b^3 (d) a^2b^2	1
3	If the distance between the points $(4, p)$ and $(1, 0)$ is 5, then the value(s) of p is (a) 4 only (b) ± 4 (c) -4 only (d) 0	1

4	If the mean and median of a distribution are 20 and 15 respectively, then its mode is: (a) 5 (b) 15 (c) 20 (d) none of these	1												
5	The least number that is divisible by all numbers from 1 to 10 (both inclusive) is: (a) 10 (b) 100 (c) 2520 (d) 5040	1												
6	A card is drawn at random from a well-shuffled deck of 52 playing cards. The probability of drawing a face card is: (a) $\frac{3}{13}$ (b) $\frac{4}{13}$ (c) $\frac{1}{13}$ (d) $\frac{6}{13}$	1												
7	In $\triangle ABC$, $DE \parallel AB$. If $CD = 3$ cm, $EC = 4$ cm, $BE = 6$ cm, then DA is equal to (a) 7.5 cm (b) 3 cm (c) 4.5 cm (d) 6 cm	1												
8	If the zeroes of the quadratic polynomial $x^2 + (a+1)x + b$ are 2 and -3 , then: (a) $a = -7$, $b = -1$ (b) $a = 5$, $b = -1$ (c) $a = 2$, $b = -6$ (d) $a = 0$, $b = -6$	1												
9	If the sum of first n terms of an AP is $3n^2 + 5n$, then its common difference is: (a) 3 (b) 6 (c) 5 (d) 8	1												
10	The nature of roots of $x^2 + 4x + 4 = 0$ is: (a) Real and distinct (b) Real and equal (c) No real roots (d) Cannot be determined	1												
11	Which of the following is the midpoint of the line segment joining (1, 3) and (5, 9)? (a) (6, 12) (b) (2, 6) (c) (3, 6) (d) (3, 4)	1												
12	If α, β are the zeroes of $x^2 - 5x + 6$, then the value of $\alpha + \beta - \alpha\beta$ is: (a) -1 (b) 1 (c) 11 (d) -11	1												
13	For the following distribution, the median class is: <table border="1"><tr><td>Class</td><td>0-10</td><td>10-20</td><td>20-30</td><td>30-40</td><td>40-50</td></tr><tr><td>Frequency</td><td>5</td><td>8</td><td>20</td><td>10</td><td>7</td></tr></table> (a) 0-10 (b) 10-20 (c) 20-30 (d) 30-40	Class	0-10	10-20	20-30	30-40	40-50	Frequency	5	8	20	10	7	1
Class	0-10	10-20	20-30	30-40	40-50									
Frequency	5	8	20	10	7									
14	Aruna has only ₹ 1 and ₹ 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is ₹ 75, then the number ₹1 and ₹2 coins are respectively (a) 35 and 15 (b) 35 and 20 (c) 15 and 35 (d) 25 and 25	1												

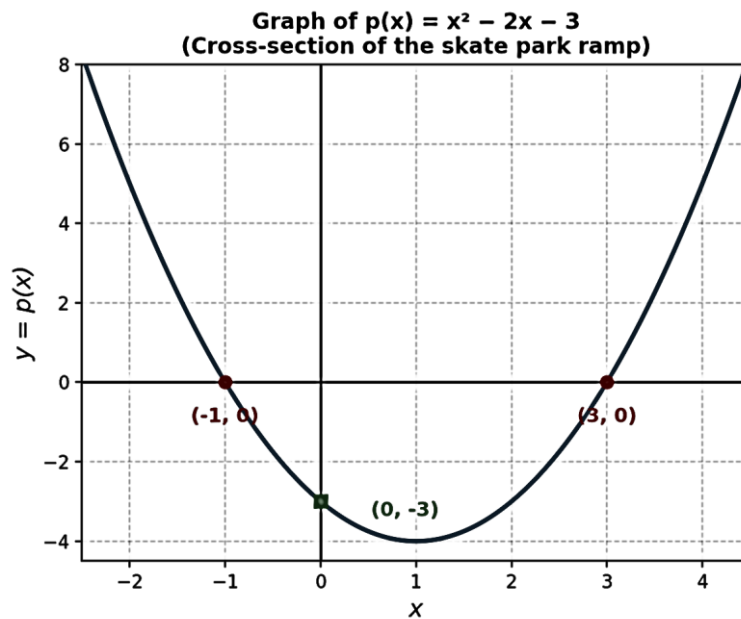
15	Which of the following is NOT a criterion for similarity of triangles? (a) AA (b) SSS (c) SAS (d) RHS	1
16	The sum of a number and its reciprocal is $\frac{65}{8}$. The number is (a) 8 (b) 4 (c) 2 (d) 6	1
17	Which of the following is an Arithmetic Progression (AP)? (a) 1, 3, 9, 27, ... (b) 2, 4, 8, 16, ... (c) 1, 4, 7, 10, ... (d) 1, 1, 2, 3, 5, ...	1
18	The pair of equations $x = a$ and $y = b$ graphically represents lines which are (a) parallel (b) intersecting at (b, a) (c) coincident (d) intersecting at (a, b)	1
	Question numbers 19 and 20 are Assertion and Reason based question. Two statements are given, one labelled Assertion (A) and the other labelled Reason (R). Select the correct answers from the codes (a), (b), (c) and (d) as given below. (a) Both A and R are true and R is the correct explanation of A. (b) Both A and R are true but R is not the correct explanation of A. (c) A is true and R is false. (d) A is false and R is true	
19	Assertion (A): For any two prime numbers p and q , $\text{HCF}(p, q) = 1$. Reason (R): For any two positive integers, $\text{HCF} \times \text{LCM} = \text{product of the numbers}$.	1
20	Assertion (A): Two players, Sania and Ashnam, play a tennis match. The probability of Sania winning the match is 0.79, and the probability of Ashnam winning the match is 0.21. Reason (R): The sum of the probabilities of two complementary events is 1.	1
	SECTION B	
21	Show that 9^n can not end with digit 0 for any natural number n .	2
22	Find the 20th term from the last term of the A.P.: 3, 8, 13, ..., 253.	2

23	a) A vertical pole of height 6 m casts a shadow 4 m long on the ground, and at the same time a tower casts a shadow 28 m long. Find the height of the tower. OR b) In the figure ABC and DBC are two right triangles. Prove that $AP \times PC = BP \times PD$. 	2
24	If $51x + 23y = 116$ and $23x + 51y = 106$, then find the value of $(x - y)$	2
25	a) Solve the quadratic equation $x^2 - (\sqrt{2} + 1)x + \sqrt{2} = 0$ using the quadratic formula. OR b) If the roots of the equation $(a - b)x^2 + (b - c)x + (c - a) = 0$ are real and equal, prove that $2a = b + c$	2
SECTION C		
26	a) A librarian wants to stack Fiction, Non-fiction and Biography books separately, subject-wise, in equal, maximum-sized stacks (same thickness). The number of books are 32, 40 and 24 respectively. Determine the number of stacks of each type, and the total number of stacks, assuming all items are of the same thickness/height. OR b) Prove that $\sqrt{3} - \sqrt{2}$ is irrational.	3
27	A box contains 12 balls of which some are red in colour. If 6 more red balls are put in the box and a ball is drawn at random, the probability of drawing a red ball double than what it was before. Find the number of red balls in the bag.	3
28	a) A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid Rs.27 for a book kept for seven days, while Susy paid Rs.21 for the book she kept for five days. Find the fixed charge and the charge for each extra day. OR b) A fraction becomes $\frac{1}{3}$ when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$ when 8 is added to its denominator. Find the fraction.	3

29	ABCD is a trapezium in which $AB \parallel DC$ and its diagonals intersect each other at the point O. Show that $\frac{AO}{BO} = \frac{CO}{DO}$.	3														
30	Find the arithmetic mean for the following data. <table border="1"><tr><td>Marks</td><td>0-10</td><td>10-20</td><td>20-30</td><td>30-40</td><td>40-50</td><td>50-60</td></tr><tr><td>No. of Students</td><td>12</td><td>8</td><td>7</td><td>3</td><td>5</td><td>5</td></tr></table>	Marks	0-10	10-20	20-30	30-40	40-50	50-60	No. of Students	12	8	7	3	5	5	3
Marks	0-10	10-20	20-30	30-40	40-50	50-60										
No. of Students	12	8	7	3	5	5										
31	If $Q(0,1)$ is equidistant from $P(5, -3)$ and $R(x,6)$, find the values of x . Also find the distance PR.	3														
SECTION D																
32	Draw the graphs of the equations $x - y - 1 = 0$ and $2x + y - 8 = 0$. Determine the coordinates of the vertices of the triangle formed by these lines and the x -axis, and shade the triangular region.	5														
33	a) Sides AB and AC and median AD of a triangle ABC are respectively proportional to sides PQ and PR and median PM of another triangle PQR. Show that $\triangle ABC \sim \triangle PQR$. OR b) In the figure, $\angle BED = \angle BDE$ & E divides BC in the ratio 2 : 1. Prove that $AF \times BE = 2 AD \times CF$. 	5														
34	A survey regarding the heights (in cm) of 51 girls of Class X of a school was conducted and the following data were obtained: <table border="1"><tr><td>Height (in cm)</td><td>Number of Girls</td></tr><tr><td>Less than 140</td><td>4</td></tr><tr><td>Less than 145</td><td>11</td></tr><tr><td>Less than 150</td><td>29</td></tr><tr><td>Less than 155</td><td>40</td></tr><tr><td>Less than 160</td><td>46</td></tr><tr><td>Less than 165</td><td>51</td></tr></table> Find the median of the above data.	Height (in cm)	Number of Girls	Less than 140	4	Less than 145	11	Less than 150	29	Less than 155	40	Less than 160	46	Less than 165	51	5
Height (in cm)	Number of Girls															
Less than 140	4															
Less than 145	11															
Less than 150	29															
Less than 155	40															
Less than 160	46															
Less than 165	51															

35	a) The sum of the areas of two squares is 468 m^2. If the difference of their perimeters is 24 m, find the sides of the two squares. OR b) A train covers a distance of 90 km at a uniform speed. Had the speed been 15 km/h more, it would have taken 30 minutes less for the same journey. Find the original speed of the train.	5
	SECTION E	
36	Case Study.1 Mrs. Radhika Nair, aged 42, is an environmental science teacher and a passionate volunteer who runs a tree-plantation drive in her neighbourhood in Pune. Every weekend, she carries young saplings from her home nursery, marked O, and plants them at different spots in the community park that has been laid out on a coordinate grid (each unit represents 100 metres). Three of the plantation spots are marked A, B and C on the grid shown below. For all the Math-Gyan, observe this situation carefully and answer the following questions.  (i) Find the distance between Mrs Nair's home (nursery O) and plantation spot C. (ii) Find the distance between plantation spots A and C. (iii) Find the ratio in which plantation spot B divides the line joining spots A and C. OR (iii) Find the coordinates of plantation spot D, which divides the line segment joining A and C internally in the ratio 2:3.	1 1 2

37	Case Study.2 A school is organizing its Annual Day in a newly renovated auditorium. To make sure that every student gets a clear view of the stage, the school plans the seating in rows. The first row has 18 seats. Each successive row has 4 more seats than the row immediately before it. The auditorium has 15 rows in total. The organizing committee wants to use this arrangement to estimate the total seating capacity and plan the event.  Answer the following questions: (i) The number of seats in each row forms an Arithmetic Progression. What are the first term and common difference of this AP? (ii) How many seats are there in the 10th row? (iii) Find the total number of seats in all 15 rows. OR (iii) Principal says, “The number of seats in the last row is more than twice the number of seats in the first row.” Verify whether the statement is correct.	1 1 2
38	Case Study.3 A city corporation is designing a new skate park. One of the ramps has a curved cross-section that can be modelled by a polynomial. An engineer plots the path of the ramp's surface on a graph, taking the base of the ramp along the x-axis (in metres) and the height along the y-axis (in metres). The graph of the polynomial $p(x)$, representing the cross-section of the ramp, is a smooth upward-opening curve (parabola). It cuts the x-axis at $x = -1$ and $x = 3$, and does not touch the x-axis at any other point, as shown below:	



The engineer also finds that the polynomial can be written in the form:

$$p(x) = x^2 + bx + c$$

Based on the above information, answer the following questions:

- (i) Write the zeroes of the polynomial $p(x)$ as shown by the graph.
- (ii) Write the polynomial $p(x)$.
- (iii) Find the values of b and c and find the value of $p(0)$.

1
1
2

OR

- (iii) Find the sum and product of the zeroes of $p(x)$, and verify the relation between zeroes and its coefficients.
