No. of printed pages:9

CLASS: VIII

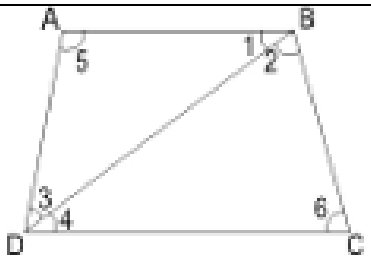
MID TERM EXAMINATION (SESSION: 2025– 26)

SUBJECT: MATHEMATICS

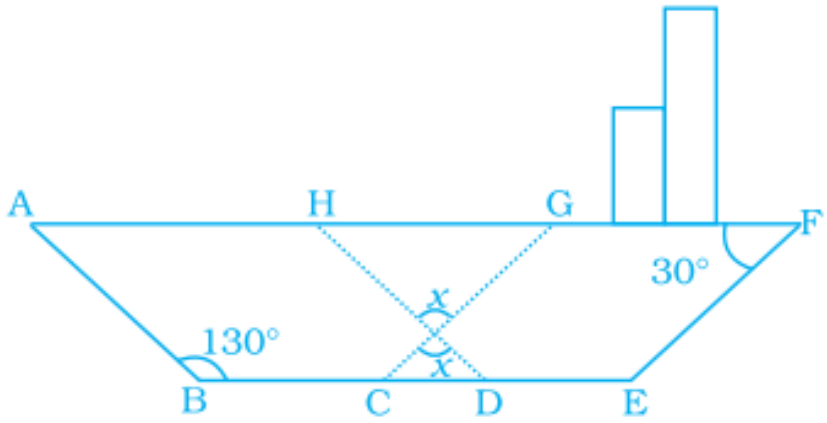
SOLUTION SET/ MARKING SCHEME – SET B1/B2

Time Allowed: 2.5 Hours **Maximum Marks: 60**

Set B1	Set B2	Expected Answers/ Value Points	Marks
		SECTION A	
(i)	(xii)	How many natural numbers lie between 18^2 and 19^2? (a) 30 (b) 37 (c) 35 (d) 36 Sol. (d) 36	1
(ii)	(xi)	If $16 - 3(x - 7) = -14$, then value of x is (a) 17 (b) 15 (c) 14 (d) 18 Sol. (a) 17	1
(iii)	(x)	If the ratio of boys to girls is 2:3, then the percentage of girls is: (a) 40% (b) 50% (c) 60% (d) 30% Sol. (c) 60%	1
(iv)	(ix)	The additive inverse of $\frac{-8}{15}$ is (a) $\frac{15}{8}$ (b) $\frac{8}{15}$ (c) $\frac{-15}{8}$ (d) $\frac{-8}{15}$ Sol. (b) $\frac{8}{15}$	1
(v)	(viii)	A table costs ₹ 1500 more than a chair. If the cost of the chair is ₹ x, which of these expressions shows the total cost of the table and the chair together, in rupees? (a) $x + 1500$ (b) $x - 1500$ (c) $2x + 1500$ (d) $2x - 1500$ Sol. (c) $2x + 1500$	1
(vi)	(vii)	In a fruit basket, one-fourth of the fruits are bananas, 30% are apples, and the rest are oranges. What percent of the fruits in the basket are oranges? (a) 30% (b) 45% (c) 40% (d) 70% Sol. (b) 45%	1
(vii)	(vi)	The multiplicative inverse of $\left(\frac{4}{9} \times \frac{-3}{7}\right)$ is (a) $\frac{12}{63}$ (b) $\frac{-12}{63}$ (c) $\frac{-4}{21}$ (d) $\frac{-21}{4}$ Sol. (d) $\frac{-21}{4}$	1
(viii)	(v)	In which of the following quadrilaterals are the diagonals equal in length?	1

		(a) Rhombus and Rectangle (b) Square and Rectangle (c) Rhombus and Parallelogram (d) Square and Rhombus Sol. (b) Square and Rectangle	
(ix)	(iv)	Two coins are tossed simultaneously. Find the probability of getting exactly one head. (a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) $\frac{3}{4}$ (d) 1 Sol. (a) $\frac{1}{2}$	1
(x)	(iii)	ABCD is a trapezium with AB parallel to CD. Which of the following CANNOT be concluded based on this?  (a) $\angle 1 = \angle 4$ (b) $\angle 2 = \angle 3$ (c) $\angle 1 + \angle 2 + \angle 6 = 180°$ (d) $\angle 3 + \angle 4 + \angle 5 = 180°$ Sol. (b) $\angle 2 = \angle 3$	1
(xi)	(ii)	**B1:** The smallest number by which 162 must be divided to get a perfect square is (a) 2 (b) 3 (c) 4 (d) 6 Sol. (a) 2 **B2:** The smallest number by which 432 must be divided to get a perfect square is (a) 2 (b) 3 (c) 4 (d) 6 Sol. (b) 3	1
(xii)	(i)	Monthly salary of a person is Rs. 15000. The central angle of the sector representing his expenses on food and house rent on a pie chart is 60°. The amount he spends on food and house rent is (a) Rs. 5000 (b) Rs. 2500 (c) Rs. 6000 (d) Rs. 9000 Sol. (b) Rs. 2500	1
	SECTION B		
2.	7.	Solve: $\frac{2x+1}{4} = \frac{3x-1}{3}$ Sol. $\frac{2x+1}{4} = \frac{3x-1}{3}$ $3(2x+1) = 4(3x-1) \Rightarrow 6x + 3 = 12x - 4$ $6x = 7 \Rightarrow x = \frac{7}{6}$	1 ½ ½

3.	6.	Find the number of sides of a regular polygon whose each interior angle has a measure of 135°. Sol. Measure of each interior angle $= 135°$ Measure of each exterior angle = 180° - 135° = 45° Number of sides of the polygon= $\frac{360}{45} = 8$	 1 1
4.	5.	Write a Pythagorean triplet whose one member is 16. Sol. Let $2m = 16$ $\Rightarrow m = 8$ $m^2 - 1 = 64 - 1 = 63$ and $m^2 + 1 = 64 + 1 = 65$ Therefore, the required triplet is 16, 63, 65	 1 1
5.	4.	Solve: $0.25(4x - 5) = 0.75x + 8$ **OR** Solve: $\frac{m}{3} - \frac{m-2}{2} = \frac{1}{6} + \frac{m-1}{6}$ Sol. $0.25(4x - 5) = 0.75x + 8$ $\frac{1}{4}(4x - 5) = \frac{75}{100}x + 8$ $x - \frac{5}{4} = \frac{3}{4}x + 8$ $\frac{x}{4} = \frac{37}{4}$ $x = 37$ **OR** $\frac{m}{3} - \frac{m-2}{2} = \frac{1}{6} + \frac{m-1}{6}$ $\frac{2m - 3m + 6}{6} = \frac{1 + m - 1}{6}$ $\frac{-m + 6}{6} = \frac{m}{6}$ $2m = 6$ $m = 3$	 1 1
6.	3.	Verify $x \times (y \times z) = (x \times y) \times z$ for $x = \frac{2}{3}, y = \frac{-3}{7}, z = \frac{1}{2}$ Sol. $LHS = x \times (y \times z) = \frac{2}{3} \times \left(\frac{-3}{7} \times \frac{1}{2}\right) = \frac{2}{3} \times \frac{-3}{14} = \frac{-1}{7}$ $RHS = (x \times y) \times z = \left(\frac{2}{3} \times \frac{-3}{7}\right) \times \frac{1}{2} = \frac{-2}{7} \times \frac{1}{2} = \frac{-1}{7}$	 1 1
7.	2.	A washing machine costs Rs 50,000. It depreciates at 25% per year. Find the value of machine after 2 years? Sol. Value of machine = $50000\left(1 - \frac{25}{100}\right)^2 = 50000 \times \frac{75}{100} \times \frac{75}{100}$ $= Rs\ 28125$	 1 1

	SECTION C		
8.	10.	The marked price of a mobile phone is ₹40,000. The shopkeeper allows a 10% discount on it. (i) Find the price of the mobile phone after the discount. (ii) If 18% GST is levied on the discounted price, what is the final amount payable by the customer? Sol. Marked price = Rs 40000 Discount $= \frac{10}{100} \times 40000 = 4000$ Discounted price = $40000 - 4000 = 36000$ Tax = $\frac{18}{100} \times 36000 = 6480$ Amount to be paid by customer = $36000 + 6480 = Rs\ 42480$	 1 1 1
9.	9.	ABCD is a trapezium such that AB||CD, ∠A : ∠D = 2 :1, ∠B : ∠C = 7 : 5. Find the angles of the trapezium. **OR** In the following figure of a ship, ABDH and CEFG are two parallelograms. Find the value of x.  Sol. Let $\angle A = 2x, \angle D = x, \angle B = 7y, \angle C = 5y$ AB||CD $\angle A + \angle D = 180$ (co-interior angles) $2x + x = 180$ $3x = 180 \Rightarrow x = 60$ AB||CD $\angle B + \angle C = 180$ (co-interior angles) $7y + 5y = 180$ $12y = 180 \Rightarrow y = 15$ $\angle A = 2 \times 60 = 120°$ $\angle D = 60°$ $\angle B = 7 \times 15 = 105°$ $\angle C = 5 \times 15 = 75°$	 1 1 1

		OR ABDH is a parallelogram $\angle B + \angle HDB = 180$ (Adjacent angles are supplementary) $\angle HDB = 180 - 130 = 50°$ CEFG is a parallelogram $\angle F = \angle GCE = 30°$ $30 + 50 + x = 180$ (Angle sum property of triangle) $x = 100°$	 1 1 1
10.	8.	Using suitable rearrangement, find the sum of $\frac{7}{10} + \frac{1}{7} + 2 + \frac{-4}{5} + \frac{5}{14}$. **OR** Simplify $\frac{2}{3} \times \frac{-5}{7} + \frac{7}{3} + \frac{2}{3} \times \frac{2}{7}$ by using suitable property. Sol. $\frac{7}{10} + \frac{1}{7} + 2 + \frac{-4}{5} + \frac{5}{14} = \frac{7}{10} + \frac{-4}{5} + 2 + \frac{1}{7} + \frac{5}{14}$ $= \frac{7-8}{10} + 2 + \frac{2+5}{14}$ $= \frac{-1}{10} + 2 + \frac{7}{14} = \frac{-1}{10} + 2 + \frac{1}{2} = \frac{-1+20+5}{10} = \frac{24}{10} = \frac{12}{5}$ **OR** $\frac{2}{3} \times \frac{-5}{7} + \frac{7}{3} + \frac{2}{3} \times \frac{2}{7}$ $= \frac{2}{3} \times \left(\frac{-5}{7} + \frac{2}{7}\right) + \frac{7}{3}$ (Commutative and Distributive property) $= \frac{2}{3} \times \left(-\frac{3}{7}\right) + \frac{7}{3} = \frac{-2}{7} + \frac{7}{3} = \frac{-6+49}{21} = \frac{43}{21}$	 1 1 1 1 1 1
		SECTION D	
11.	13.	In a laboratory, the count of bacteria in a certain experiment was increasing at the rate of 2.5% per hour. Find the number of bacteria at the end of 2 hours if the initial count was 3,50,000. **OR** Find the difference between Compound Interest and Simple Interest on Rs 45,000 at 12% per annum for 2 years. Sol. Number of bacteria at the end of 2 hours = $350000\left(1 + \frac{2.5}{100}\right)^2$ $= 350000 \times \frac{102.5}{100} \times \frac{102.5}{100}$ $= 367718.75$ **OR** $P = Rs.45000, R = 12\%, t = 2\ years$ $SI = \frac{45000 \times 12 \times 2}{100} = 10800$	 1 1+1+1 1 2

		$CI = 45000\left(1+\frac{12}{100}\right)^2 - 45000 = 45000 - 56448 = 11448$ Difference = 11448-10800 = 648	2 1
12.	12.	**B1:** A survey was conducted to find out the favourite sports of a group of students. Represent the data using a pie chart.	

Sports	Cricket	Football	Badminton	Tennis	Others
Number of students	60	45	25	35	15

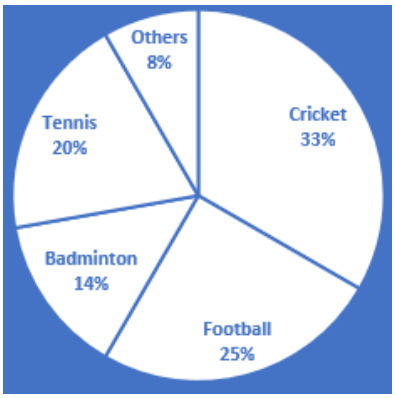
B2: A survey was conducted to find out the favourite sports of a group of students. Represent the data using a pie chart.

Sports	Cricket	Football	Badminton	Tennis	Others
Number of students	70	25	30	40	15

Sol.

Sports	Number of students	Central angle
Cricket	60	$\frac{60}{180}\times 360 = 120°$
Football	45	$\frac{45}{180}\times 360 = 90°$
Badminton	25	$\frac{25}{180}\times 360 = 50°$
Tennis	35	$\frac{35}{180}\times 360 = 70°$
Others	15	$\frac{15}{180}\times 360 = 30°$
Total	180	

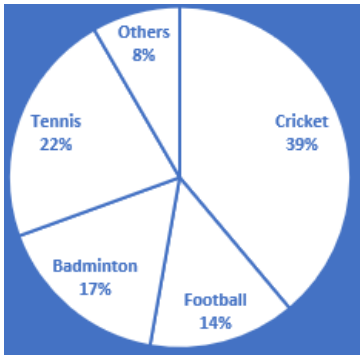
2



3

OR

Sports	Number of Students	Central angle
Cricket	70	$\frac{70}{180} \times 360 = 140°$
Football	25	$\frac{25}{180} \times 360 = 50°$
Badminton	30	$\frac{30}{180} \times 360 = 60°$
Tennis	40	$\frac{40}{180} \times 360 = 80°$
Others	15	$\frac{15}{180} \times 360 = 30°$
Total	180	



13. 11.

(a) Find the smallest square number that is divisible by each of the numbers 36, 48 and 60.

(b) Find the square of 63 without actual multiplication.

OR

Find the square root of 8335.69 by long division method.

Sol. (a) $36 = 2 \times 2 \times 3 \times 3$ 2

$48 = 2 \times 2 \times 2 \times 2 \times 3$

$60 = 2 \times 2 \times 3 \times 5$

LCM = $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 = 720$

$720 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$ 1

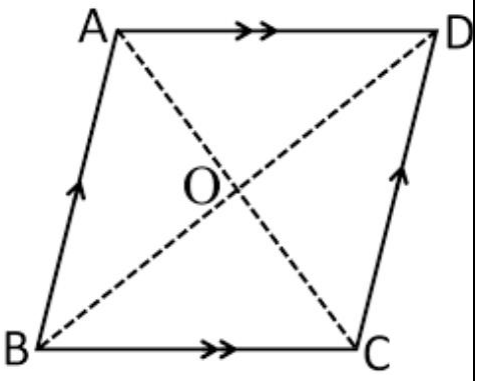
As 5 is not occurring in pair, so multiply 720 by 5

Hence required number = 3600

(b) $(63)^2 = (60 + 3)^2 = (60 + 3)(60 + 3)$ 1

$= 60(60 + 3) + 3(60 + 3) = 3600 + 180 + 180 + 9 = 3969$ 1

OR

		$\sqrt{8335.69} = 91.3$ $\begin{array}{r\|l} & 91.3 \\ \hline 9 & \overline{8335.69} \\ & 81 \\ \hline 181 & 235 \\ & 181 \\ \hline 1823 & 5469 \\ & -5469 \\ \hline & 0 \end{array}$	5
	SECTION – E		
14.	14.	**CASE STUDY – I** A landscape designer is planning a rhombus-shaped flower bed in a park. The rhombus is named ABCD, and its diagonals AC and BD intersect at point O. The diagonals divide the rhombus into four triangular sections to plant different types of flowers. The following measurements (in cm) are given: • OA = $4x$ • OC = $x + 6$ • OB = 15 • OD = $5x + y$  (i) Find the value of x. (ii) Find the value of y. (iii) (a) Find the length of side AD. Hence calculate the perimeter of rhombus ABCD. **OR** (iii) (b) If $\angle DBC = 48°$, find the measure of ∠OAD. Sol. (i) $4x = x + 6 \Rightarrow x = 2$ (ii) $15 = 5x + y \Longrightarrow y = 5$ (iii) (a) $AD^2 = OA^2 + OD^2 = 64 + 225 = 289$ $AD = 17\ cm$ Perimeter of Rhombus ABCD = 4 ×17 = 68 cm **OR** (iii) (b) $\angle DBC = 48°$ In $\triangle AOD$, $48 + 90 + \angle OCB = 180$ (Angle sum property of triangle) $\angle OCB = 42°$ $\angle OAD = 42°$ (Alternate interior angle)	1 1 2 2
15.	15.	**CASE STUDY – II** The event in-charge of a school is organizing a cultural program in the auditorium. A total of 1,050 chairs are available for the audience. She wants to arrange the	

		chairs in a perfect square layout, where the number of rows is equal to the number of columns, to create a neat and balanced seating arrangement. Based on this information, answer the following question: (i) Is 1,050 a perfect square number? Justify. (ii) If the chairs are arranged to form the largest possible perfect square, how many chairs will be left unused? (iii) (a) How many additional chairs are required to form the next perfect square arrangement? **OR** (iii) (b) If the number of chairs are increased to 2116 and they are arranged in a perfect square layout, how many rows will there be Sol. (i) $1050 = 2 \times 3 \times 5 \times 5 \times 7$, It is not a perfect square number. (ii) 26 chairs will be left unused. (Show working) (iii) (a) 39 more chairs are required to form the next perfect square arrangement. (Show working) **OR** (iii) (b) Number of rows = 46 (show working)	1 1 2 2
16.	16.	**CASE STUDY III** During Library Week celebrations, the school library keeps 50 numbered cards (from 1 to 50) into a box. Each card number represents a specific book on display. A student is asked to draw one card at random, and he/she receives the book that corresponds to the selected number as a gift. Based on this information, answer the following question: (i) How many total outcomes are possible? (ii) What is the probability that the number on the chosen card is a one-digit prime number**?** (iii) (a) What is the probability that the number on the chosen card **is** divisible by 2 and 3**?** **OR** (b) What is the probability that the number on the chosen card is not a perfect square number? Sol. (i) 50 (ii) $\frac{4}{50} = \frac{2}{25}$ (iii) (a) $\frac{8}{50} = \frac{4}{25}$ **OR** (iii) (b) $\frac{43}{50}$	1 1 2 2