

Marking Scheme Strictly Confidential (For Internal and Restricted use only) Secondary School Examination, 2026 (2nd Board Examination) MATHEMATICS (STANDARD) (041) (PAPER CODE 30(B))	
<u>General Instructions: -</u>	
1.	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the Spot Evaluation Guidelines carefully.
2.	“Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, Evaluation done and several other aspects. It’s leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in News Paper/Website etc. may invite action under various rules of the Board and BNS.”
3.	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one’s own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In Class-X, while evaluating the Competency-based questions, please try to understand given answer and even if reply is not from Marking Scheme but correct competency is enumerated by the candidate, due marks should be awarded.
4.	The Marking scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
5.	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
6.	Evaluators will mark (✓) wherever answer is correct. For wrong answer CROSS ‘X’ be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. This is most common mistake which evaluators are committing.
7.	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totalled up and written on the left-hand margin and encircled. This may be followed strictly.

8.	If a question does not have any parts, marks must be awarded on the left-hand margin and encircled. This may also be followed strictly.
9.	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note “ Extra Question ”.
10.	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
11.	A full scale of 0 to 80 marks as given in Question Paper has to be used. Please do not hesitate to award full marks if the answer deserves it.
12.	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines). This is in view of the reduced syllabus and number of questions in question paper.
13.	Ensure that you do not make the following common types of errors committed by the Examiner in the past: - • Leaving answer or part thereof unassessed in an answer book. • Giving more marks for an answer than assigned to it. • Wrong totalling of marks awarded to an answer. • Wrong transfer of marks from the inside pages of the answer book to the title page. • Wrong question wise totalling on the title page. • Wrong totalling of marks of the two columns on the title page. • Wrong grand total. • Marks in words and figures not tallying/not same. • Wrong transfer of marks from the answer book to Online Award List. • Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) • Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
14.	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0) Marks.
15.	Any un assessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
16.	The Examiners should acquaint themselves with the guidelines given in the “ Guidelines for Spot Evaluation ” before starting the actual evaluation.
17.	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totalled and written in figures and words.
18.	The candidates are entitled to obtain Photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.

MARKING SCHEME
MATHEMATICS (Subject Code–041)
(PAPER CODE: 30(B))

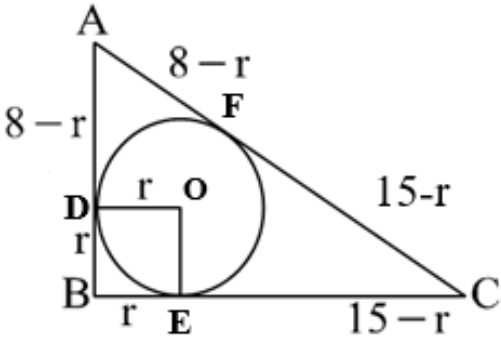
Q. No.	EXPECTED OUTCOMES/VALUE POINTS	Marks
	SECTION A This section has 20 Multiple Choice Questions (MCQs) carrying 1 mark each.	
1.	If x and y are two odd prime numbers, such that $x > y$, then $x^2 - y^2$ is : (A) an odd number (B) an even number (C) a prime number (D) an odd prime number	
Sol.	(B) an even number	1
2.	If one zero of the quadratic polynomial $p(x) = (k - 2)x^2 - (k + 2)x - 14$ is -2 , then the value of k is : (A) -2 (B) 2 (C) -3 (D) 3	
Sol.	(D) 3	1
3.	The number of polynomials having 3 and -7 as zeroes is : (A) One (B) Two (C) Three (D) More than three	
Sol.	(D) More than three	1
4.	The 10 th term from the end of an AP $-12, -9, -6, \dots, 60$ is : (A) 36 (B) 30 (C) 33 (D) 32	
Sol.	(C) 33	1
5.	If the common difference of an AP is -5 , then $a_{28} - a_{23}$ is equal to : (A) -5 (B) -25 (C) 25 (D) 5	
Sol.	(B) -25	1

6.	The points $(-5, 0)$, $(5, 0)$ and $(0, -3)$ are the vertices of : (A) a right-angled triangle (B) an isosceles triangle (C) an equilateral triangle (D) a scalene triangle	
Sol.	(B) an isosceles triangle	1
7.	PQ and PR are the tangents drawn from an external point P to a circle with centre O and radius 3 cm. If the length of PQ is 4 cm, then the area of quadrilateral PQOR is : (A) 24 cm^2 (B) 12 cm^2 (C) 6 cm^2 (D) 15 cm^2	
Sol.	(B) 12 cm^2	1
8.	Given that $\cos^2 \theta - \sin^2 \theta = \frac{1}{2}$, $(0^\circ < \theta \leq 90^\circ)$. The value of $\sin \theta$ is : (A) 1 (B) $\frac{\sqrt{3}}{2}$ (C) $\frac{1}{2}$ (D) $\frac{1}{\sqrt{2}}$	
Sol.	(C) $\frac{1}{2}$	1
9.	In a ΔABC, $PQ \parallel BC$, where P, Q are points on AB and AC respectively and $\frac{AP}{PB} = \frac{AQ}{QC} = \frac{1}{2}$, then : (A) $PQ = BC$ (B) $PQ = \frac{1}{3} BC$ (C) $PQ = \frac{1}{2} BC$ (D) $PQ = \frac{1}{4} BC$	
Sol.	(B) $PQ = \frac{1}{3} BC$	1

10.	For the following distribution : <table><tr><td><i>Class :</i></td><td>0 – 10</td><td>10 – 20</td><td>20 – 30</td><td>30 – 40</td><td>40 – 50</td></tr><tr><td><i>Frequency :</i></td><td>14</td><td>19</td><td>16</td><td>24</td><td>13</td></tr></table> the sum of lower limits of modal class and median class is : (A) 40 (B) 50 (C) 60 (D) 70	<i>Class :</i>	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	<i>Frequency :</i>	14	19	16	24	13	
<i>Class :</i>	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50									
<i>Frequency :</i>	14	19	16	24	13									
Sol.	(B) 50	1												
11.	The length of tangent from an external point P on a circle with centre O is : (A) always greater than OP (B) equal to OP (C) always less than OP (D) always half of OP													
Sol.	(C) always less than OP	1												
12.	If in two triangles ABC and DEF, $\angle A = \angle E$ and $\angle F = \angle B$, then which of the following is not true ? (A) $\frac{BC}{DF} = \frac{AC}{DE}$ (B) $\frac{BC}{DF} = \frac{BA}{EF}$ (C) $\frac{AB}{FE} = \frac{AC}{ED}$ (D) $\frac{AB}{DE} = \frac{BC}{DF}$													
Sol.	(D) $\frac{AB}{DE} = \frac{BC}{DF}$	1												
13.	If $\sin A - \cos A = 0$, then $2 \tan A$ is equal to : (A) 0 (B) 2 (C) $\frac{1}{2}$ (D) $\sqrt{3}$													
Sol.	(B) 2	1												

14.	If $P(\frac{x}{3}, 7)$ is the mid-point of the line segment joining the points $A(-7, 6)$ and $B(-5, 8)$, then the value of x is : (A) -2 (B) 2 (C) 18 (D) -18	
Sol.	(D) -18	1
15.	The area of a sector of a circle of radius 14 cm cut off by an arc of length 22 cm, is : (A) 154 cm^2 (B) 308 cm^2 (C) 77 cm^2 (D) $\frac{77}{2} \text{ cm}^2$	
Sol.	(A) 154 cm^2	1
16.	The perimeter of a sector of a circle of radius 3.5 cm with central angle 90° is : (A) 12.5 cm (B) 5.5 cm (C) 9 cm (D) 18 cm	
Sol.	(A) 12.5 cm	1
17.	The slant height of a right circular cone of base diameter 14 cm and height 24 cm is : (A) $\sqrt{772}$ cm (B) 25 cm (C) 28 cm (D) 11 cm	
Sol.	(B) 25 cm	1
18.	The probability that the month of June has 5 Tuesdays, is : (A) $\frac{2}{7}$ (B) $\frac{3}{7}$ (C) $\frac{4}{7}$ (D) $\frac{5}{7}$	
Sol.	(A) $\frac{2}{7}$	1

	Questions number 19 and 20 are Assertion and Reason based questions. Two statements are given, one labelled as Assertion (A) and the other is labelled as Reason (R). Select the correct answer to these questions from the options (A), (B), (C) and (D) as given below. (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A). (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the 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) : If one zero of a quadratic polynomial $x^2 - \frac{3}{2}kx + 7$ is negative of the other, then the value of k is $\frac{2}{3}$. Reason (R) : Sum of zeroes of a quadratic polynomial $ax^2 + bx + c$ is $-\frac{b}{a}$.	
Sol.	(D) Assertion (A) is false, but Reason (R) is true.	1
20.	Assertion (A) : In two triangles, if the corresponding angles are equal, then the triangles are similar. Reason (R) : If the areas of two similar triangles are equal, then the triangles are congruent.	
Sol.	(B) Both Assertion (A) and Reason (R) are true, but Reason (R) is <i>not</i> the correct explanation of the Assertion (A).	1
	SECTION B This section has 5 Very Short Answer (VSA) type questions carrying 2 marks each.	
21.	Three bells toll at intervals of 48 seconds, 72 seconds and 108 seconds, respectively. If they start tolling together, after how many seconds will they toll together next ?	

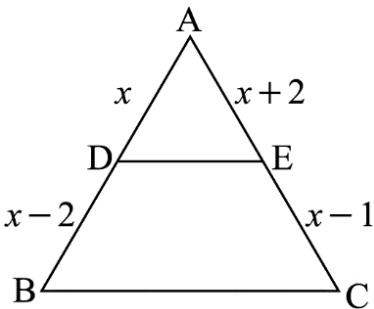
Sol.	 Let r be the radius of the circle. $OD = OE = BE = BD = r$, $AD = 8 - r = AF$, $CE = 15 - r = CF$ $AC = \sqrt{8^2 + 15^2} = 17$ $AC = 8 - r + 15 - r = 17$ $2r = 23 - 17 = 6$ $r = 3 \text{ cm}$	$\frac{1}{2}$ 1 $\frac{1}{2}$
23.	Find the value of : $2 \sin^2 30^\circ \cdot \tan 60^\circ - 3 \cos^2 60^\circ \cdot \sec 30^\circ$.	
Sol.	$2 \sin^2 30^\circ \cdot \tan 60^\circ - 3 \cos^2 60^\circ \cdot \sec 30^\circ$ $= 2 \left(\frac{1}{2} \right)^2 \cdot (\sqrt{3}) - 3 \left(\frac{1}{2} \right)^2 \cdot \left(\frac{2}{\sqrt{3}} \right)$ $= \frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} = 0$	$1\frac{1}{2}$ $\frac{1}{2}$
24.	The length of the minute hand of a clock is 4.2 cm. Find the area swept by the minute hand in 5 minutes.	
Sol.	Angle swept in 5 minutes $= 30^\circ$ Area swept by minute hand $= \frac{30}{360} \times \frac{22}{7} \times 4.2 \times 4.2$ $= 4.62 \text{ cm}^2$	$\frac{1}{2}$ 1 $\frac{1}{2}$

25. (a)	Two cubes each of edge 12 cm are joined edge to edge. Find the surface area of the resulting cuboid.	
Sol.	In resulting cuboid, $l = 24$ cm, $b = 12$ cm, $h = 12$ cm Surface Area of the resulting cuboid $= 2(24 \times 12 + 12 \times 12 + 12 \times 24)$ $= 2(720) = 1440 \text{ cm}^2$	$\frac{1}{2}$ 1 $\frac{1}{2}$
	OR	
25. (b)	A solid is hemispherical at the bottom and conical of same radius, above it. If the surface areas of the two parts are equal, find the ratio of its radius and the height of its conical part.	
Sol.	Let r be the radius and h be the height of the conical part. $2\pi r^2 = \pi r \sqrt{h^2 + r^2}$ $\Rightarrow 4r^2 = h^2 + r^2$ $\Rightarrow 3r^2 = h^2$ $\Rightarrow \frac{r}{h} = \frac{1}{\sqrt{3}}$ or $1:\sqrt{3}$	1 1
	SECTION C This section has 6 Short Answer (SA) type questions carrying 3 marks each.	
26.	Prove that $\sqrt{5}$ is an irrational number.	
Sol.	Let $\sqrt{5}$ be a rational number. $\therefore \sqrt{5} = \frac{p}{q}$, where $q \neq 0$ and p & q are coprime. $5q^2 = p^2 \Rightarrow p^2$ is divisible by 5 $\Rightarrow p$ is divisible by 5 ----- (i) Let $p = 5a$, where 'a' is some integer $25a^2 = 5q^2 \Rightarrow q^2 = 5a^2 \Rightarrow q^2$ is divisible by 5 $\Rightarrow q$ is divisible by 5 ----- (ii) (i) and (ii) leads to a contradiction as 'p' and 'q' are coprime.	$\frac{1}{2}$ 1 1 $\frac{1}{2}$

Sol.	Let first term = a, common difference = d $S_8 = 4[2a + 7d] = 124 \Rightarrow 2a + 7d = 31$ $S_{20} = 10[2a + 19d] = 670 \Rightarrow 2a + 19d = 67$ On solving, $a = 5$ and $d = 3$ AP is 5, 8, 11, ... Hence 15th term = $a + 14d = 5 + 42 = 47$	$\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$
29.	Prove that the opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.	
Sol.	$\triangle OAP \cong \triangle OAS \Rightarrow \angle 1 = \angle 8$ (i) Similarly, $\left. \begin{array}{l} \angle 2 = \angle 3 \\ \angle 5 = \angle 4 \\ \angle 6 = \angle 7 \end{array} \right\}$ (ii) $\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5 + \angle 6 + \angle 7 + \angle 8 = 360^\circ$ $2 [(\angle 1 + \angle 2) + (\angle 5 + \angle 6)] = 360^\circ$ (using (i) & (ii)) $\Rightarrow \angle AOB + \angle COD = 180^\circ = \angle BOC + \angle AOD$ $\therefore$ Opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.	1 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$

30. (a)	Prove that : $\frac{\tan \theta + \sin \theta}{\tan \theta - \sin \theta} = \frac{\sec \theta + 1}{\sec \theta - 1}$	
Sol.	$\begin{aligned} \text{LHS} &= \frac{\tan \theta + \sin \theta}{\tan \theta - \sin \theta} \\ &= \frac{\frac{\sin \theta}{\cos \theta} + \sin \theta}{\frac{\sin \theta}{\cos \theta} - \sin \theta} \\ &= \frac{\sin \theta \left(\frac{1}{\cos \theta} + 1 \right)}{\sin \theta \left(\frac{1}{\cos \theta} - 1 \right)} \\ &= \frac{\sec \theta + 1}{\sec \theta - 1} = \text{RHS} \end{aligned}$	1 1 1
	OR	
30. (b)	Prove that : $(1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) = 2$	
Sol.	$\begin{aligned} \text{LHS} &= (1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) \\ &= \left(\frac{\sin A + \cos A - 1}{\sin A} \right) \left(\frac{\cos A + \sin A + 1}{\cos A} \right) \\ &= \frac{(\sin A + \cos A)^2 - 1^2}{\sin A \cdot \cos A} \\ &= \frac{\sin^2 A + \cos^2 A + 2 \sin A \cdot \cos A - 1}{\sin A \cdot \cos A} \\ &= \left(\frac{2 \sin A \cdot \cos A}{\sin A \cdot \cos A} \right) = 2 = \text{RHS} \end{aligned}$	1 1 1
31.	A field is 600 m long and 25 m broad. A tank of length 40 m, breadth 15 m and depth 12 m is dug in the field. The Earth taken out of it is spread evenly over the field. By how much is the level of the field raised ?	

Sol.	Volume of earth dugout = $40 \times 15 \times 12 = 7200 \text{ m}^3$ Remaining area of the field = $600 \times 25 - 40 \times 15$ $= 15000 - 600 = 14400 \text{ m}^2$ $\therefore$ Level of the field raised = $\frac{7200}{14400} = \frac{1}{2} \text{ m}$ or 0.5 m	1 1 1
	SECTION D This section has 4 Long Answer (LA) type questions carrying 5 marks each.	
32. (a)	Convert $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$, $x \neq -4, 7$ into a quadratic equation in standard form and hence solve it.	
Sol.	$\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$ $\Rightarrow \frac{x-7-x-4}{(x+4)(x-7)} = \frac{11}{30}$ $\Rightarrow x^2 - 3x + 2 = 0$ $\Rightarrow (x-1)(x-2) = 0$ $\Rightarrow x = 1, 2$	1 2 1 1
	OR	
32. (b)	A man can row a boat in still water at the rate of 7 km per hour. He takes 14 hours in going 45 km upstream and coming back to the same spot. Find the speed of the stream.	
Sol.	Let speed of stream be x km/h. $\therefore$ Speed of boat upstream = $(7 - x) \text{ km/h}$. and Speed of boat downstream = $(7 + x) \text{ km/h}$. $\therefore \frac{45}{7+x} + \frac{45}{7-x} = 14$ $\Rightarrow 45(7-x+7+x) = 14(49-x^2)$ $\Rightarrow x^2 = 4$	 1

	$x \neq -2$ $x = 2$ $\therefore$ speed of stream is 2 km/h.	1
33.	If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then prove that the other two sides are divided in the same ratio. Using the above, find the value of x, if a line $DE \parallel BC$ intersects the sides AB and AC of $\triangle ABC$ such that $AD = x$, $DB = x - 2$, $AE = x + 2$ and $CE = x - 1$.	
Sol.	Correct Given, To prove & Construction Correct proof  $\frac{x}{x-2} = \frac{x+2}{x-1}$ $\Rightarrow x = 4$	$1\frac{1}{2}$ $2\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
34. (a)	As observed from the top of a 90 m high lighthouse from sea level, the angles of depression of two ships are 30° and 45°. If one ship is exactly behind the other on the same side of the lighthouse, find the distance between the two ships. (Use $\sqrt{3} = 1.732$)	

Sol.	Let CD be the lighthouse and two ships are at positions A and B and angle of depressions from top of lighthouse to two ships are 30° and 45° respectively. $BC = x, AC = y$ $\frac{90}{x} = \tan 45^\circ = 1$ $\Rightarrow x = 90 \text{ m}$ $\frac{90}{y} = \tan 30^\circ = \frac{1}{\sqrt{3}}$ $\Rightarrow y = 90\sqrt{3} \text{ m}$ Distance between two ships = $AB = 90\sqrt{3} - 90 = 65.88 \text{ m}$	1 1 1 1 1
	OR	
34. (b)	The angle of elevation of the top of a building from the foot of a tower is 30° and the angle of elevation of the top of the tower from the foot of the building is 45°. If the tower is 30 m high, find the height of the building.	
Sol.		

	Let h be the height of the building and x be the distance between the building and the tower. $\frac{30}{x} = \tan 45^\circ = 1$ $\Rightarrow x = 30 \text{ m}$ $\frac{h}{x} = \tan 30^\circ = \frac{1}{\sqrt{3}}$ $h = \frac{x}{\sqrt{3}} = \frac{30}{\sqrt{3}} = 10\sqrt{3} \text{ m}$	1 1 1 2																											
35.	The mean of the following distribution is 18 and the sum of frequencies is 48. Find x and y and hence find the mode of the frequency distribution. <table><tr><td><i>Class :</i></td><td>11 – 13</td><td>13 – 15</td><td>15 – 17</td><td>17 – 19</td><td>19 – 21</td><td>21 – 23</td><td>23 – 25</td></tr><tr><td><i>Frequency :</i></td><td>3</td><td>6</td><td>x</td><td>13</td><td>y</td><td>5</td><td>4</td></tr></table>	<i>Class :</i>	11 – 13	13 – 15	15 – 17	17 – 19	19 – 21	21 – 23	23 – 25	<i>Frequency :</i>	3	6	x	13	y	5	4												
<i>Class :</i>	11 – 13	13 – 15	15 – 17	17 – 19	19 – 21	21 – 23	23 – 25																						
<i>Frequency :</i>	3	6	x	13	y	5	4																						
Sol.	<table><tr><td>x_i</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td><td>22</td><td>24</td><td>Total</td></tr><tr><td>f_i</td><td>3</td><td>6</td><td>x</td><td>13</td><td>y</td><td>5</td><td>4</td><td>$31+x+y$</td></tr><tr><td>$f_i x_i$</td><td>36</td><td>84</td><td>$16x$</td><td>234</td><td>$20y$</td><td>110</td><td>96</td><td>$560+16x+20y$</td></tr></table> $31 + x + y = 48 \Rightarrow x + y = 17$ ----- (i) Mean = $18 = \frac{560 + 16x + 20y}{48}$ $\Rightarrow 4x + 5y = 76$ ----- (ii) On solving eq. (i) and (ii), $x = 9, y = 8$ Modal Class = 17-19 Mode = $17 + \frac{13 - 9}{2 \times 13 - 9 - 8} \times 2$ $= 17 + \frac{8}{9}$ $= \frac{161}{9}$ or 17.88	x_i	12	14	16	18	20	22	24	Total	f_i	3	6	x	13	y	5	4	$31+x+y$	$f_i x_i$	36	84	$16x$	234	$20y$	110	96	$560+16x+20y$	Correct table 1 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$
x_i	12	14	16	18	20	22	24	Total																					
f_i	3	6	x	13	y	5	4	$31+x+y$																					
$f_i x_i$	36	84	$16x$	234	$20y$	110	96	$560+16x+20y$																					

SECTION E		
This section has 3 case study based questions carrying 4 marks each.		
36.	Arun, Ravi and Promod are three friends living on the same street. The position of their houses on the street are represented by points A, R and P respectively, and their coordinates are A(1, 7), R(4, 5) and P(7, 3). Their school, represented by point S, is a point on x-axis equidistant from A and P and a library represented by a point L is on y-axis equidistant from R and P. Based on the information given above, answer the following questions : (i) Find the distance between A and P. (ii) Find the ratio in which R is dividing the line segment AP. (iii) (a) Find the coordinates of point S. OR (b) Find the coordinates of point L.	
Sol.	(i) $AP = \sqrt{(7-1)^2 + (3-7)^2} = \sqrt{52}$ or $2\sqrt{13}$ (ii) $AR = \sqrt{(4-1)^2 + (5-7)^2} = \sqrt{13}$ $\frac{AR}{AP} = \frac{\sqrt{13}}{2\sqrt{13}} = \frac{1}{2}$ $\Rightarrow$ R divides line segment AP in ratio 1:1 (iii) (a) As point S lies on the x axis, let coordinates of S be (a, 0). Here, AS=PS $\Rightarrow (a-1)^2 + (0-7)^2 = (a-7)^2 + (0-3)^2$ $\Rightarrow 12a = 8$ $\Rightarrow a = \frac{2}{3}$ $\therefore S\left(\frac{2}{3}, 0\right)$ OR	1 $\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$

	(iii) (b) As point L lies on the y axis, let coordinates of L be (0, b). Here, RL=PL $\Rightarrow (0 - 4)^2 + (b - 5)^2 = (0 - 7)^2 + (b - 3)^2$ $\Rightarrow 4b = -17$ $\Rightarrow b = -\frac{17}{4}$ $\therefore L\left(0, -\frac{17}{4}\right)$	1 $\frac{1}{2}$ $\frac{1}{2}$
37.	Ankita went to a fair organised in an open ground near her school. After taking a round she decided to enjoy rides on the giant wheel and also play hoopla (a game in which you throw a ring on the items kept in a stall and if the ring covers any object completely, you get it). The number of times she rides the giant wheel is 2 less than twice the number of times she played hoopla. Each ride cost ₹ 5 and a game of hoopla costs ₹ 6 and she spent ₹ 54 in the fair. Based on the information given above, answer the following questions : (i) Taking x as the number of times she played hoopla and y as the number of rides on the wheel, represent the above statements algebraically. (ii) Solve the above equations for x and y.	
Sol.	(i) $y = 2x - 2$ $6x + 5y = 54$ (ii) On solving equations $2x - y = 2$ and $6x + 5y = 54$, $x = 4, y = 6$	1 1 1+1

38.	Deepak decided to count the total number of coins in his piggy bank. After counting, he finds the following : <table><tr><td><i>Denomination :</i></td><td>₹ 1</td><td>₹ 2</td><td>₹ 5</td><td>₹ 10</td></tr><tr><td><i>Number of coins :</i></td><td>40</td><td>48</td><td>36</td><td>26</td></tr></table> His friend Anil was asked to take one coin at random from the collection of these coins. Based on the information given above, answer the following questions : (i) Find the probability of drawing a ₹ 5 coin. (ii) Find the probability of drawing a ₹ 5 or a ₹ 10 coin. (iii) (a) What is the probability of not drawing a ₹ 10 coin ? OR (b) What is the probability of not drawing a ₹ 1 coin ?	<i>Denomination :</i>	₹ 1	₹ 2	₹ 5	₹ 10	<i>Number of coins :</i>	40	48	36	26	
<i>Denomination :</i>	₹ 1	₹ 2	₹ 5	₹ 10								
<i>Number of coins :</i>	40	48	36	26								
Sol.	Total number of coins = 150 (i) $P(\text{₹ 5 coin}) = \frac{36}{150}$ or $\frac{6}{25}$ (ii) $P(\text{₹ 5 or ₹ 10 coin}) = \frac{36 + 26}{150}$ or $\frac{31}{75}$ (iii) (a) $P(\text{not ₹ 10 coin}) = 1 - \frac{26}{150}$ $= \frac{124}{150}$ or $\frac{62}{75}$ OR (iii) (b) $P(\text{not ₹ 1 coin}) = 1 - \frac{40}{150}$ $= \frac{110}{150}$ or $\frac{11}{15}$	1 1 1 1 1 1										