Marking Scheme

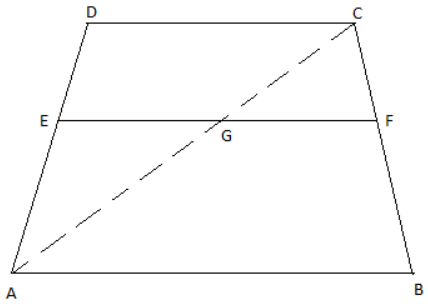
Class X Session 2024-25

MATHEMATICS STANDARD (Code No.041) (FOR VISUALLLY IMPAIRED)

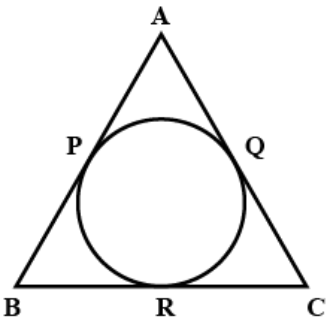
TIME: 3 hours MAX.MARKS: 80

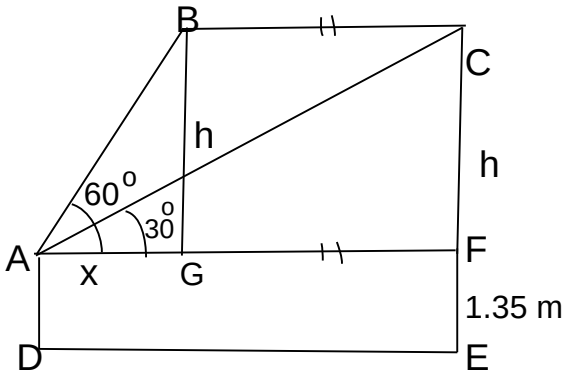
Q.No.	Section A	Marks
1.	D) -6,6	1
2.	B) -5	1
3.	D) From a point inside a circle only two tangents can be drawn.	1
4.	A) 7	1
5.	B) 20 cm	1
6.	A) $\frac{11}{9}$	1
7.	C) 2	1
8.	B) $8x^2$- 20	1
9.	C) 30	1
10.	B) 12 cm	1
11.	A) Irrational and distinct	1
12.	C) $\frac{3}{\sqrt{3}}$	1
13.	B) $\frac{594}{7}$	1
14.	B) $\frac{3}{8}$	1
15.	B) (-4, 0)	1
16.	A) median	1
17.	C) (3,0)	1
18.	D) $\frac{3}{26}$	1
19.	B)	1
20.	D)	1

	Section B	
21. (A)	$480 = 2^5 \times 3 \times 5$ $720 = 2^4 \times 3^2 \times 5$ LCM (480,720) = $2^5 \times 3^2 \times 5 = 1440$ HCF (480, 720) = $2^4 \times 3 \times 5 = 240$ OR	½ ½ ½ ½
(B)	85 = 5x17, 238 = 2x7x17 HCF(85, 238) = 17 17 = 85xm -238 m = 3	1 1
22.(A)	Total number of possible outcomes = 6x6=36 For a product to be odd, both the numbers should be odd. Favourable outcomes are (7,7) (7,9) (7,11) (9,7) (9,9) (9, 11) (11,7) (11,9) (11,11) no. of favourable outcomes = 9 P (product is odd) = $\frac{9}{36}$ or $\frac{1}{4}$ OR	½ 1 ½
(B)	Total number of three-digit numbers = 900. Numbers with hundredth digit 8 & and unit's digit 5 are 805,815, 825,....,895 Number of favourable outcomes = 10 P(selecting one such number) = $\frac{10}{900}$ or $\frac{1}{90}$	½ 1 ½
23.	$$\frac{2\ (\frac{\sqrt{3}}{2})^2\ -\ (\frac{1}{\sqrt{3}})^2}{(\sqrt{2})^2}$$ $= \frac{7}{12}$	1 ½ ½
24	Let the required point be (x,0) $\sqrt{(8-x)^2\ +\ 25} = \sqrt{41}$ => $(8-x)^2 = 16$ => 8 - x = ±4 => x = 4 , 12 Two points on the x-axis are (4,0) & (12,0).	½ ½ 1

25.	AB = $\sqrt{(3+5)^2 + (0-6)^2}$ = 10 BC = $\sqrt{(9-3)^2 + (8-0)^2}$ = 10 AC = $\sqrt{(9+5)^2 + (8-6)^2}$ = $10\sqrt{2}$ Since AB = BC, therefore Δ ABC is isosceles	½ ½ ½ ½
	Section C	
26.(A)	 Join AC, meeting EF in G. In △ADC, $\frac{AE}{ED} = \frac{AG}{GC}$ (EG‖DC)------(1) In △ABC, $\frac{AG}{GC} = \frac{BF}{FC}$ (GF‖AB)--------(2) From equations (1) and (2) ,we get $\frac{AE}{ED} = \frac{BF}{FC}$	1 1 1
	OR	
(B)	Given, ΔABC ~ ΔDEF $\therefore \frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{DF}$ $\Rightarrow \frac{4}{6} = \frac{BC}{9} = \frac{CA}{12}$ ∴ BC = 6 cm and CA = 8 cm Perimeter of ΔABC = 4 + 6 + 8 = 18 cm	1 1 1

27.	Let the numbers be x and 18-x. $\frac{1}{x} + \frac{1}{18-x} = \frac{9}{40}$ => 18×40 = 9x(18-x) => x^2 -18 x + 80=0 => (x-10)(x-8) =0 => x=10, 8. => 18-x =8, 10 Hence two numbers are 8 and 10.	½ 1 1 ½
28.	From given polynomial $\alpha + \beta = \frac{5}{6}$, $\alpha\beta = \frac{1}{6}$ $\alpha^2 + \beta^2 = (\frac{5}{6})^2 - 2 \times \frac{1}{6} = \frac{13}{36}$ And $\alpha^2 \beta^2 = (\frac{1}{6})^2 = \frac{1}{36}$ => $x^2 - \frac{13}{36}x + \frac{1}{36}$ ⇨ Required polynomial is $36x^2 - 13x + 1$	1 1 ½ ½
29.	$(cos\theta + sin\theta)^2 + (cos\theta - sin\theta)^2 = 2\,(cos^2\theta + sin^2\theta) = 2$ => $(1)^2 + (cos\theta - sin\theta)^2 = 2$ => $(cos\theta - sin\theta)^2 = 1$ => $cos\theta - sin\theta = \pm 1$	1 ½ 1 ½
30.(A)	Angle described by minute hand in 5 min = 30°. Length of minute hand =18 cm = r. Area swept by minute hand in 35 minutes =($\frac{22}{7}$x18x18×$\frac{30}{360}$) x 7 = 594cm^2. OR	2 1
(B)	Angle subtended by minor arc=360˚-300˚=60˚ Area of minor arc= $\frac{60°}{360°}$ x 3.14x 6 x 6 = 18.84cm^2	1 2
31.	Let √3 be a rational number. ∴ √3 =$\frac{p}{q}$, where q≠0 and let p & q be co-prime. $3q^2 = p^2 \Longrightarrow p^2$ is divisible by 3 $\Longrightarrow$ p is divisible by 3 ----- (i) $\Longrightarrow$ p = 3a, where 'a' is some integer $9a^2 = 3q^2 \Longrightarrow q^2 = 3a^2 \Longrightarrow q^2$ is divisible by 3 $\Longrightarrow$ q is divisible by 3----- (ii)	½ 1 1

	(i) and (ii) leads to contradiction as 'p' and 'q' are co-prime.	½
	Section D	
32.(A)	Let the monthly incomes of A and B be ₹ 8x and ₹ 7x respectively and the expenditures of A and B be ₹ 19y and ₹ 16y respectively. A.T.Q. 8x – 19y = 2500 ------(1) 7x – 16y = 2500 ------(2) Solving equations (1) and (2), we get x = 1500 ∴ Monthly income of A = 8 × 1500 = 12000 and monthly income of B = 7 × 1500 = 10500 ∴ Monthly incomes of A and B are ₹12000 and ₹ 10500 respectively.	1 1 1 1 1
	OR	
(B)	Let car I starts from A with speed x km/hr and car II Starts from B with speed y km/hr (x>y) Case I- when cars are moving in the same direction. Distance covered by car I in 9 hours = 9x. Distance covered by car II in 9 hours = 9y Therefore 9 (x-y) = 180 => x-y= 20 ……. (i) Case II- when cars are moving in opposite directions. Distance covered by Car I in 1 hour = x Distance covered by Car II in 1 hour = y Therefore x + y=180 …….. (ii) Solving (i) and (ii) we get, x=100 km/hr, y=80 km/hr.	2 2 1
33.	Correct given, to prove, construction, figure Correct proof  BP=BR and CQ=CR (tangent from B and C)	1 2 ½

	AB=AC AB−AP=AC−AP AB−AP=AC−AQ (as AP=AQ) ⇒BP=CQ ⇒BR=CR (as CQ=CR) Hence, BC is bisected at the point of contact.	½ ½ ½
34.	 Let A be the eye level & B, C are positions of balloon Distance covered by balloon in 12 sec = 3x12 = 36 m BC = GF = 36 m tan 60^0 = $\sqrt{3}$ = $\frac{h}{x}$ => h = $x\sqrt{3}$ …….. (i) tan 30^0 = $\frac{1}{\sqrt{3}}$ = $\frac{h}{x+36}$ => h = $\frac{x+36}{\sqrt{3}}$ …….. (ii) Solving (i) and (ii) h= $18\sqrt{3}$ = 31.14 m Height of balloon from ground = 1.35 + 31.14 = 32.49 m	Correct figure 1mark 1 1 1 1

35.

Class	x	f	u=$\frac{x-102.5}{5}$	fu	cf
85-90	87.5	15	-3	-45	15
90-95	92.5	22	-2	-44	37
95-100	97.5	20	-1	-20	57
100-105	102.5	18	0	0	75
105-110	107.5	20	1	20	95
110-115	112.5	25	2	50	120
		Σf = 120		Σfu = -39	

Correct table 2marks

Mean = $\overline{x}$ = 102.5 - 5 x $\frac{39}{120}$ — 1

= 100.875 — ½

Median class is 100-105

Median = 100 + $\frac{5}{18}$ (60-57) = 100.83 — ½, 1

OR

Monthly Expenditure	f_i	x_i	fixi
1000-1500	24	1250	30,000
1500-2000	40	1750	70,000
2000-2500	33	2250	74,250
2500-3000	**X=28**	**2750**	**77,000**
3000-3500	30	3250	97,500
3500-4000	22	3750	82,500
4000-4500	16	4250	68,000
4500-5000	7	4750	33,250

Correct table 2marks

172+x=200 — 1

X=28 — 1

Mean= $\frac{532500}{200}$ — 1

= 2662.5

Section E

36.(i) First term a = 3, A.P is 3, 6, 9, 12…..,24 — ½

common difference d = 6-3 = 3 — ½

(ii) 34 = 3+ (n-1)3

	=> n = 34/3 = $11\frac{1}{3}$ which is not a positive integer. Therefore, it is not possible to have 34 jars in a layer if the given pattern is continued.	½ ½
(iii)(A)	$S_n = \frac{n}{2}$ [2x3 + (n-1) 3] $= \frac{n}{2}$ [6 + 3n-3] $= \frac{n}{2}$ [3+3n] $= 3\frac{n}{2}$ [1+n] s_8 = 3 x $\frac{8}{2}$ (1+8) = 108 OR	½ 1 ½
(iii) (B)	A.P will be 6, 9, 12, a= 6, d=3 t_5 = 6 + (5-1)3 = 6 + 12 = 18	½ 1 ½
37. (i)	$\frac{h1}{20} = \frac{50}{10}$(where $h1$=height of tower) height of tower,$h1$= 100m	½ ½
(ii)	$\frac{h2}{20} = \frac{20}{10}$ (where $h2$=height of student's house) height of student's house,$h2$ =40m	½ ½
(iii) A)	$\frac{l1}{12} = \frac{100}{20}$(where $l1$ = length of the shadow of the tower) length of the shadow of the tower, $l1$=60m OR	1 1
(iii) (B)	$\frac{l2}{40} = \frac{40}{100}$ (where $l2$ = length of the shadow of Student's house) length of the shadow of Student's house,$l2$=16m	1 1
38. (i)	l= $\sqrt{r^2 + h^2}$ = $\sqrt{(1.5)^2 + (2)^2}$ = $\sqrt{2.25 + 4}$ = $\sqrt{6.25}$ = 2.5 m	½ ½

(ii)	CSA of cone = Πrl	½
	= $\frac{22}{7}$ x 1.5 x 2.5	½
	= 11.78 m^2	
(iii) (A)	CSA of cylinder = 2Π rh	
	= 2 x $\frac{22}{7}$ x 1.5 x 7	1
	= 66 m^2	
	Cost of metal sheet used = 66 x 2000	1
	= ₹1,32,000	
	OR	
(iii) (B)	Volume of cylinder = $\Pi\ r^2$ h	
	= $\frac{22}{7}$ x $(1.5)^2$ x 7	½
	= 49.5 m^3	
	Volume of cone = $\frac{1}{3}\Pi\ r^2$ h	
	=$\frac{1}{3}$ x $\frac{22}{7}$ x $(1.5)^2$ x 2	1
	= 4.71 m^3	
	Total capacity = 49.5 + 4.71 = 54.21 m^3	½