MARKING SCHEME

SAMPLE PAPER

MATHEMATICS-CLASS XII

	SECTION A		
Q.No.	**Value Points**	**Marks**	**Total**
1	36		1
2	$\begin{bmatrix} 6 & -1 \\ -7 & 3 \end{bmatrix}$		1
3	$(\sqrt[3]{x-3})$		1
4	$\frac{2\pi}{5}$		1
5	**4x-4y+33=0**		1
6	$\sqrt{5}$		1
7	2		1
8	$\frac{3}{2\sqrt{2}} tan^{-1}(\sqrt{2}\ x^2) + c$		1
9	X=4 and y=3		1
10	$\frac{-9}{\sqrt{14}}$		1
	SECTION B		
11	Property of Id element Id element (1,0) Prtoperty of Inverse Inverse doesn't	1 1 1 1	4
12	Application of correct formula Correct equation Solving $4x^2 - 31x - 8 = 0$ and x=8 OR Application of formula Second application Combining to get $tan^{-1}\frac{25}{25} = \frac{\pi}{4}$	1 1 2 1 1 2	4
13	Use of three properties and Conclusion	2 2	4
14	Calculation of LHL Calculation of RHL Conclusion LHL=RHL=f(0)=3/2	11/2 11/2 1	4

15	Finding of dy/dx and rearranging OR Writing correct derivatives Rearrangement and proof	2+2 1+1 2	4
16	Finding first derivative Simplification Expressing as perfect squares and conclusion	1 1 2	4
17	Expressing the denominator in cos or sin. Applying the correct integral Simplification.or any other alternate methods OR Using partial fraction and finding three constants Evaluating three integrals and simplification,An: $\frac{11}{10}\log\left(\frac{\sqrt{x^2+1}}{x+3}\right)-\frac{3}{11}tan^{-1}x+c$	1 1 2 2 2	4
18	Identification and I.F-linear and I.F.is $Cosec^3x$ Solving :y$Cosec^3x$ =$\int Sin2x\,Cosec^3xdx+c$ Writing particular solution:$y=sin^2x(-2+4sinx)$ OR Separating the variables Inegrating by substitution Solving and writing Particular solution:$\frac{(1+logx)^2}{2}+tan^{-1}y\ =\frac{\pi}{4}\ +\frac{1}{2}$	11/2 2 1/2 1 1 2	4
19	Identification and substitution Separating variables Integrating and replacing v by x/y Solu. Is $x+ye^{\frac{y}{x}}\ =c$	1 1 2	4
20	Concept of unit vector Sum of **2î +4ĵ-5$\hat{k}$ and λ î +2ĵ+$\widehat{3k}$** **Modulus of the above sum** **Dot product and value of λ=1**	1/2 1 ½ 2	4
21	Equation of line is $\frac{x-1}{a}=\frac{y-2}{b}=\frac{z-3}{c}$ Concept of normal and line(perpependicular) Solving of equations a-b+2c=0 and 3a+b+c=0 as a=-3,b=5 and c=4 Writing the final equatrion	1 1 11/2 1/2	4
22	Probabilities for not soliving Required probability=P($\overline{A}\ \overline{B}$C)+P($\overline{A}$ B$\overline{C}$)+P(A$\overline{B}\ \overline{C}$) $=\frac{11}{24}$	11/2 21/2	4
	SECTION C		
23	detA=-1$\neq 0, A^{-1}$ exists	1	

	adjA= $\begin{bmatrix} 0 & 1 & 2 \\ -2 & -9 & -23 \\ 1 & 5 & 13 \end{bmatrix}$ &B= $\begin{bmatrix} 11 \\ 5 \\ -3 \end{bmatrix}$ X= $\frac{1}{\|A\|}\ (adjA)\ B$ gives x=1,y=2and z=3	3 2	6
24	Writing the correct relation in one variable Step wise application of differentiation Obtaining the correct relationand max. volume= $\frac{8}{9}\pi R^3\left(3-\sqrt{3}\right)$ OR Finding the correct relation in one variable Step wise application of differentiation Obtaining the correct relation	2 2 2 2 2 2	6
25	Giving substitution as $x = atan^2\theta$ and simplication $Relpacing\ dx\ by\ 2asec^2\theta\ tan\theta and\ applying\ integration\ by\ parts$ Application of limits and simplification,An: $\frac{a}{2}(\pi - 2)$ OR Application of propertyand 2I Evaluating integral by substitution Appliying limits and simplification.An : $\frac{\pi^2}{4}$	2 2 2 1+1 2 2	6
26	Identification of the given curves and rough sketch Solving the equations and finding limit of integrals $4x^2$+16x-9=0 gives x=1/2and Area= $2\int_0^{\frac{1}{2}} 2\sqrt{x}\,dx + 2\int_{\frac{1}{2}}^{\frac{3}{2}} \sqrt{\frac{9}{4} - x^2}dx = \frac{9\pi}{8} + \frac{\sqrt{2}}{6} - \frac{9}{4}sin^{-1}\left(\frac{1}{3}\right)$	1 2 3	6
27	Equation of plane passing through (-1,2,1) is A(x+1)+B(y-2)+C(z-1)=0 Equation of a line joining (-3,1,2) and (2,3,4) is $\frac{x+3}{5} = \frac{y-1}{2} = \frac{z-2}{2}$ Since the plane is perpendicular to the line ,line and normal are parallel an A=5,B=2 and C=2 Equation of plane is 5x+2y+2z-1=0 Distance from origin to the plane is $\frac{1}{\sqrt{13}}$units	1 2 1 1 1	6
28	Let the old man travel xkm at 25km/hr and y km at40km/hr Objective function is z=x+y Constraints : x $\geq 0, y \geq 0$ 2x+5y ≤ 100 and $\frac{x}{25} + \frac{y}{40} \leq 1\ ie, 8x + 5y \leq 200$ Graphing two lines with scale and shading of common region Locating the corner points as O(0,0),(25,0), $\left(\frac{50}{3}, \frac{40}{3}\right)$ and (0,20)and calculation of z(max)=30 at $\left(\frac{50}{3}, \frac{40}{3}\right)$	½ ½ 2 2 1	6
29	Let E1be the event of selecting a bag from the first group And E2 E1be the event of selecting a bag from the second group A be the event of ball drawn is white	11/2	

	Then, P(E1)=3/5,P(E2)=2/5 and P(A/E1)=5/8, P(A/E2)=5/8 Therefore the required probability ,P(E1/A)= $\frac{P(E1)P(\frac{A}{E1})}{P(E1)P\left(\frac{A}{E1}\right)+P(E2)P(\left(\frac{A}{E2)}\right)}$ $= \frac{\frac{3}{5}x\frac{5}{8}}{\frac{3}{5}x\frac{5}{8}+\frac{2}{5}x\frac{1}{3}} = \frac{45}{61}$	2 1 11/2	 6