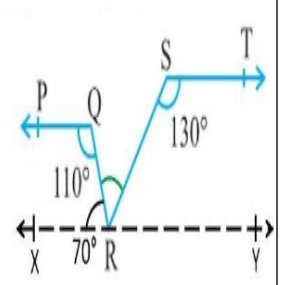
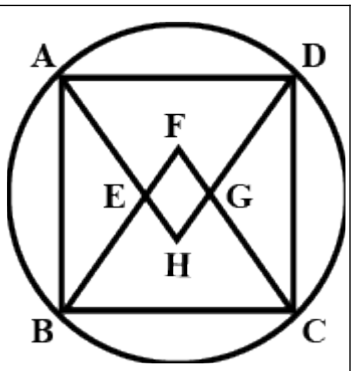
KENDRIYA VIDYALAYA SANGATHAN, RAIPUR REGION
SESSION ENDING EXAM (2024-25)
Class: IX **SUBJECT: MATHEMATICS** **MM: 80**
MARKING SCHEME

	Section-A
Q.1	(B) $\sqrt{225}$
Q.2	(C) -2
Q.3	(C) 2x+y =5
Q.4	(A) $4x^2-3x+7$
Q.5	(B) II quadrant
Q.6	(A) 3
Q.7	(A) Theorem
Q.8	(C) Postulate 3
Q.9	(B) 34^0
Q.10	(B) 117^0
Q.11	(C) Opposite angles are bisected by the diagonals
Q.12	(B) 48^0
Q.13	(A) 2 cm
Q.14	(C) 84 cm^2
Q.15	*(C) 12 cm*
Q.16	(A)7 cm
Q.17	(D) 14
Q.18	(B) 105
Q.19	(D)
Q.20	(B)
	Section-B
Q.21	$(a+b+c)^2=a^2+b^2+c^2+2ab+2bc+2ca$ $(x-2y+3z)^2=(x)^2+(-2y)^2+(3z)^2+2(x\times-2y)+2(-2y\times3z)+2(3z\times x)$ 1m ¿ $x^2+4y^2+9z^2-4xy-12yz+6zx$ 1mark **[OR]** $(x+y)^3 = x^3 + y^3 + 3xy\,(x+y)$ ½ marks Let $x=3x, y=\frac{1}{2}$ $(3x + ½)^3 = (3x)^3 + (1/2)^3 + 3(3x)(½)(3x + ½)$ ½ mark $= 3^3x^3 + \left(\frac{1}{2}\right)^3 + \frac{9x}{2}\left(3x+\frac{1}{2}\right)$ ½ mark $= 27x^3 + \frac{1}{8} + \frac{27}{2}x^2 + \frac{9}{4}x$ ½ mark $= 27x^3 + \frac{27}{2}x^2 + \frac{9}{4}x + \frac{1}{8}$
Q.22	A(3,4), B(-3,2), C(-2,-4), D(6,-3) $\frac{1}{2}\times4=2marks$
Q.23	¿ $\Delta OAD \wedge \Delta OBC$ $\angle OAB = \angle OBC$ each 90^0 $\angle AOD = \angle BOC$ vertically opposite angles 1 mark AD = BC given $\Delta OAD \cong \Delta OBC$ by AAS

	OA = OB by CPCT CD bisects AB 1 mark
Q.24	Use Euclid's axiom that when equals are subtracted from equals, the remainders are equal: Given that AC = BD point B lies between A and C, AC = AB + BC point C lies between B and D, BD = BC + CD 1 mark if AC=BD therefore AB + BC = BC + CD Subtracting BC from both sides, AB + BC - BC = BC + CD - BC AB = CD 1 mark
Q.25	$s=\frac{32}{2}=16$ Let $a=8\,cm, b=11\,cm, c=32-(8+11)=13\,cm$ ½ marks $Area=\sqrt{s(s-a)(s-b)(s-c)}$ ¿$\sqrt{16\times8\times5\times3}$ 1mark ¿$8\sqrt{30}\,cm^2$ ½ marks
	Section-C
Q.26	Given $\frac{\sqrt{3}+1}{\sqrt{3}-1}$ = a - b$\sqrt{3}$. $=\frac{\sqrt{3}+1}{\sqrt{3}-1}\times\frac{\sqrt{3}+1}{\sqrt{3}+1}$ $=\frac{(\sqrt{3}+1)2}{¿¿}$ [Since, $(a+b)(a-b)=a^2-b^2$] 1mark $=(3+2\sqrt{3}+1)/2$ $=(4+2\sqrt{3})/2$ $=2(2+\sqrt{3})/2$ $=2+\sqrt{3}$ $2+\sqrt{3}=a-b\sqrt{3}$ 1mark compare the value of a and b a=2 and b=−1 1mark OR $x=1+\sqrt{2}$ $\frac{1}{x}=\frac{1}{1+\sqrt{2}}$ $=\frac{1}{1+\sqrt{2}}$ x $\frac{\sqrt{2}-1}{\sqrt{2}-1}$ $=\frac{\sqrt{2}-1}{2-1}$ 1mark $\frac{1}{x}=\sqrt{2}-1$ $x^2+\frac{1}{x^2}=(x+\frac{1}{x})^2-2$ $=(1+\sqrt{2}+\sqrt{2}-1)^2-2$ 1mark =8-2 =6 1mark
Q.27	$P(-1)=(-1)^3+13(-1)^2+32(-1)+20=0$ $x+1$ is factor of P(x) 1mark After dividing P(x) by $x+1$, we get $P(x)=(x+1)(x^2+12x+20)$ 1mark $P(x)=(x+1)(x+2)(x+10)$ 1 mark **[OR]** If $a+b+c=0$, then $a^3+b^3+c^3=3abc$ 1 marks Let $a=x-2y, b=2y-3z, c=3z-x$

	Since $a+b+c=x-2y+2y-3z+3z-x=0$ 1mark Therefore $(x-2y)^3+(2y-3z)^3+(3z-x)^3=3(x-2y)(2y-3z)(3z-x)$ 1mark
Q.28	**(a)** Let, 2x+3y=4.37 2x+3y−4.37=0 ½ mark On comparing with ax+by+c=0 a=2,b=3,c=−4.37 ½ mark (c) Let's take the cost of a notebook as Rs. x and the cost of a pen as Rs. y. 1marks Given that cost of a notebook (x) is twice the cost of a pen(y). So, x = 2y. x – 2y = 0 1 mark
Q.29	PQ || ST ∠PQR =110 ° and ∠RST =130 °, ∠QRS = ? Construction : through R draw XY || PQ PQ || XY and QR its transversal ∴ ∠PQR + ∠QRX = 180 ° by interior consecutive angle 110 °+ ∠QRX = 180 ° 1mark ∴ ∠QRX = 70 ° Again ST|| XY and SR its transversal ∴ ∠TSR + ∠SRY = 180 ° by interior consecutive angle 130 °+ ∠SRY = 180 ° ∴ ∠SRY = 50 ° 1mark If ∠XRQ + ∠QRS + ∠SRY = 180 ° by straight angle . 70 °+ ∠QRS + 50 °= 180 ° ∴ ∠QRS = 60 ° 1mark 
Q.30	ΔABC with AB =AC. BA produced at D, AD=AB. Prove that : ∠BCD = 90 ° Proof: Δ *ABC* with AB = AC. ∴ ∠ABC =∠ACB =x (by opposite angles of equal sides) ½ mark InΔ ACD AD=AB=AC ∴ AD=AC. 1mark ∴ ∠ACD =∠ADC =y (by opposite angles of equal sides) In ΔBCD, by angle sum property ∠B + ∠C + ∠D = 180 , x + x + y + y = 180, 2x + 2y = 180^0 1mark X + y = 90^0 ∴ ∠BCD = 90^0 ½ mark
Q.31	Given: h = 10m, r = 24m (i) Slant height $l=\sqrt{h^2+r^2}=\sqrt{100+576}=\sqrt{676}=26$m 1mark (ii) Canvas required = Curved surface area of the tent ¿ $\pi rl=3.14\times24\times26=1959.36\,m^2$ 1mark Cost of $1\,m^2$ canvas is Rs 70 Therefore, cost of $1959.36\,m^2$ canvas is $1959.36\times70=Rs\,137155$ aprox. 1mark **[OR]** Given: diameter = 10.5cm, $r=\frac{10.5}{2}=5.25\,cm$ ½ marks Required surface area = inner curved surface area of hemisphere ¿ $3\pi r^2=3\times3.14\times5.25\times5.25=259.6\,cm^2$ 1mark

	Cost of tin-plating $1\,cm^2 = Rs\,\frac{16}{100}$ ½ marks Cost of tin-plating $259.6\,cm^2 = Rs\,\frac{16}{100} \times 259.6 = Rs\,41.5$ 1mark
	Section-D
Q.32	(a) Let x=0.2353535…… ---------1 Multiple by 100 in both side 100x=23.535353…… ----------2 By equation 1 and 2 1 mark 100x - x = 23.5353…..- 0.23535…. 99x = 23.3 Therefore x = 23.3/99 1 mark X= 233/990 p/q = 233/990 ½ mark (b) each rational number ½ x 5 marks
Q.33	1 mark for each solution.
Q.34	Cost = Rs 4989.6 $inside\ surface\ area\ of\ the\ dome \times Rs\,20 = Rs\,4989.6$ 1 mark $inside\ surface\ area\ of\ the\ dome = \frac{4989.6}{20} = 249.48\,m^2$ (ii) $2\pi r^2 = 249.48$ $2 \times \frac{22}{7} \times r^2 = 249.48$ 1 mark $r = 6.3\,m$ 1 mark $Volume\ of\ the\ air\ inside\ the\ dome = \frac{2}{3}\pi r^3$ $Volume\ of\ the\ air\ inside\ the\ dome = \frac{2}{3} \times \frac{22}{7} \times (6.3)^3$ 1 mark $= 523.908\,m^3$ 1 mark [OR] Since the area of the canvas = $551\,m^2$ and area of the canvas lost in wastage is $1\,m^2$, therefore the area of canvas available for making the tent is $(551-1) = 550\,m^2$ ow, the surface area of the tent = $550\,m^2$ and the required base radius of the conical tent $r = 7\,m$ 1 mark Therefore, curved surface area of tent = $550\,m^2$ $\pi rl = 550$ 1 mark $\frac{22}{7} \times 7 \times l = 550$ $l = 25\,m$ ½ marks therefore, $h = \sqrt{l^2 - r^2} = \sqrt{25^2 - 7^2} = 24\,m$ 1 mark $Volume\ of\ the\ conical\ tent = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times \frac{22}{7} \times 7 \times 7 \times 24$ 1 mark ¿$1232\,m^3$ ½ marks

Q.35	Given, To prove, Diagram, Const. 2 marks correct proof 3 marks **[OR]** Diagram 1 marks  Here, ABCD is a cyclic quadrilateral. AH,BF,CF and DH are the angle bisectors of $\angle A, \angle B, \angle C$ and $\angle D$. $\Rightarrow \angle FEH = \angle AEB$ --- (1) [Vertically opposite angles] $\Rightarrow \angle FGH = \angle DGC$ ---- (2) [Vertically opposite angles] 1 mark Adding (1) and (2), $\Rightarrow \angle FEH + \angle FGH = \angle AEB + \angle DGC$ --- (3) Now, by angle sum property of a triangle, $\Rightarrow \angle AEB = 180^0 - \left(\frac{1}{2} \angle A + \frac{1}{2} \angle B\right)$ ---- (4) $\Rightarrow \angle DGC = 180 - \left(\frac{1}{2} \angle C + \frac{1}{2} \angle D\right)$ ---- (5) 1 mark Substituting (4) and (5) in equation (3) $\Rightarrow \angle FEH + \angle FGH = 180^0 - \left(\frac{1}{2} \angle A + \frac{1}{2} \angle B\right) + 180^0 - \left(\frac{1}{2} \angle C + \frac{1}{2} \angle D\right)$ $\Rightarrow \angle FEH + \angle FGH = 360^0 - \frac{1}{2} (\angle A + \angle B + \angle C + \angle D)$ 1 mark $\Rightarrow \angle FEH + \angle FGH = 360^0 - \frac{1}{2} \times 360^0$ $\Rightarrow \angle FEH + \angle FGH = 180^0$ ½ mark Now, the sum of opposite angles of quadrilateral EFGH is 180^0. ½ mark $\therefore$ EFGH is a cyclic quadrilateral. Hence, the quadrilateral formed by angle bisectors of a cyclic quadrilateral is also cyclic.
	Section-E
Q.36	**(i)** (c) 2 1mark (ii) (b) Quadratic 1 mark **(iii)** $P(4) = -5(4)^2 + 40 \times 4 + 1.2$ 1 mark $= 81.2$ 1 mark **[OR]** (iii) $P(2) = 0, P(3) = 0$ $1 \times 2 = 2\, marks$
Q.37	i. ΔEAD congruent to ΔCBD 1mark ii. Distance ED = $\sqrt{5^2 + 12^2} = 13$ 1mark iii. Area of $\Delta AED = 30 cm^2$ 1mark iv. $\angle B'A'C' = 60°$ 1mark
Q.38	**(i)** (c) 55 – 65 1mark (ii) (a) 35 – 45 1 mark **(iii)** 14+5 = 19 2 marks **[OR]** 23+21+11+6 = 61 2 marks