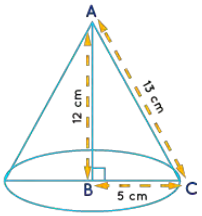
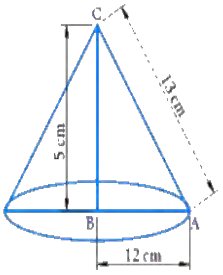
SESSION ENDING EXAMINATION 2023-24

Class – IX **Marking Scheme** **Subject - Mathematics**

S. No.	**Section A** **Section A consists of 20 questions of 1 mark each**	Marks
1	D	1
2	D	1
3	C	1
4	B	1
5	B	1
6	A	1
7	C	1
8	D	1
9	A	1
10	B	1
11	C	1
12	B	1
13	B	1
14	A	1
15	B	1
16	A	1
17	B	1
18	C	1
19	A	1
20	A	1
	Section B consists of 5 questions of 2 marks each	
21	493 cm cube (nearly) (correct formula, correct calculation, correct answer) 3845.44 g(nearly)	1+1
22	$\lfloor(2x-(2x-y)\rfloor\{(2x)^2+2x(2x-y)+(2x-y)^2\}$ $y(12x^2-6xy+y^2)$	1+1
23	(0,0) (0,-4)	1 + 1
24	A C B AC = CB Also AC + AC = BC + AC. (Equals are added to equals) BC + AC coincides with AB $\Rightarrow$ 2AC = AB $\Rightarrow$ AC = $\frac{1}{2}$ AB. Or Correct explanation	1 1 2
25	$\frac{S_1}{S_2}=\frac{4\pi r_1^2}{4\pi r_2^2}$ ½ $\frac{1}{4}=\frac{r_1^2}{r_2^2}$ $\frac{r_1}{r_2}=\frac{1}{2}$ ½ $\frac{V_1}{V_2}=\frac{\frac{4}{3}\pi r_1^3}{\frac{4}{3}\pi r_2^3}=\frac{r_1^3}{r_2^3}=$ $(\frac{1}{2})^3\frac{V_1}{V_2}=\frac{1}{8}$ ½ ½ OR $r=\sqrt{l^2-h^2}$ $r=\sqrt{169-144}=\sqrt{25}$ r = 5 cm ½ $V=\frac{1}{3}\pi r^2h$ ½ $V=\frac{1}{3}\times\frac{22}{7}\times5\times5\times12$ ½ $V=314.28\ cm^3$ V = 0.31428 litres ½	1+1
	Section C consists of 6 questions of 3 marks each	

26	**Solution** (Verified by Toppr) Given, $x - \frac{1}{x} = 5$ Squaring both the sides, $\Rightarrow (x - \frac{1}{x})^2 = 5^2$ $\Rightarrow x^2 + \frac{1}{x^2} - 2(x)(\frac{1}{x}) = 25$ $\Rightarrow x^2 + \frac{1}{x^2} = 25 + 2$ $\Rightarrow x^2 + \frac{1}{x^2} = 27$ Now, $x^3 - \frac{1}{x^3}$ $= (x - \frac{1}{x})\left[(x)^2 + (\frac{1}{x})^2 + (x)(\frac{1}{x})\right]$ $= 5(27 + 1)$ $= 140$ or $P(x) = x^3 - 23x^2 + 142x - 120$ $P(1) = 0$, $(x-1)$ is factor of $p(x)$ $P(x) = x^2(x-1) - 22x(x-1) + 120(x-1)$ $= (x-1)(x^2 - 22x + 120)$ $=(x-1)(x-10)(x-12)$	1 1 1 1 1 1
27	For correct representation + construction	1+2
28	For correct diagram For correct proof	1 2
29	For correct figure For correct proof OR In ΔAMC and ΔBMD AM=BM (M is midpoint of AB) ∠AMC=∠BMD(vertically opposite angles)CM=DM (given) ∴ΔAMC≅ΔBMD (by SAS congruence rule) ∴ AC=BD (by CPCT) ⇒∠DBC+∠ACB=180∘(co−interior angles) ⇒ ∠DBC+90∘=180∘(∠ACB=90∘)⇒∠DBC=180∘−90∘⇒∠DBC=90∘ ⇒DB=AC (By CPCT)…(i) In ΔDBC and ΔACB DB=AC (From (i))BC=BC(Common)∠DBC=∠ACB=90∘ ∴ΔDBC≅ΔACB by SAS congruence	1 2 1+1+1
30	i) $375\sqrt{15}m^2$ (Using correct formula + correct calculation + correct answer) ii) $900\sqrt{3}m^2$ (Using correct formula + correct calculation + correct answer)	½ +1/2+1/2 ½+1/2+ 1/2
31	For 3 correct solutions	1+1+1
	Section D	
	Section D consists of 4 questions of 5 marks each	
32	i)$\angle POS + \angle SOQ = 180^0$ $\angle ROT = 90^0$ Ii) Since BE and FC are normal to PQ and RS respectively, therefore, BE||FC Let, ∠ABE=∠EBC=x[PQ is a mirror, so angle of incidence is equal to angle of reflection] ∠FCD=∠BCF=y[RS is a mirror, so angle of incidence is equal to angle of reflection] Now considering BE and FC, taking BC as transversal,	1 1 .5 .5

	∠EBC=∠BCF.....(i) [alternate interior angle] i.e. x=y i.e. ∠ABE=∠FCD.....(ii) Adding equation (i) and (ii) ∠EBC+∠ABE=∠BCF+∠FCD ∠ABC=∠BCD Now if we take line AB and CD in consideration, alternate interior angles that are ∠ABC and ∠BCD are equal. Therefore, AB∥CD	.5 .5 .5 .5
33	find Slant height = 25 m (Using correct formula + correct calculation + correct answer) find height = 24 m (Using correct formula + correct calculation + correct answer) volume of the tent 1232m^3 (Using correct formula + correct calculation + correct answer) or (a) Since the triangle is revolved about the side 12 cm, a solid cone is formed with a height of 12 cm and radius of the base of 5 cm as shown below.  Volume of a cone having radius 'r', and height 'h', = 1/3πr²h Radius of the cone, 'r' = 5 cm Height of the cone, 'h' = 12 cm Volume of the cone = 1/3πr²h = 1/3 × π × 5 cm × 5 cm × 12 cm = 100π cm^3 Volume of the cone is 100π cm^3. (b) Since the triangle is revolved about the side 5 cm, a solid cone if formed with a height of 5 cm and radius of the base of 12 cm.  Volume of a cone having radius 'r' and height 'h' = 1/3πr²h Radius of the cone, r =12cm Height of the cone, h = 5cm Volume of the cone = 1/3πr²h = (1/3) × π × 12cm × 12cm × 5cm = 240π cm^3 (c) Ratio = Volume of the cone in (a)/ Volume of the cone in (b) = 100π : 240π = 5 :12 The volume of the cone is 240π cm^3 and the required ratio is 5 :12	1+1 1 2 2 2 1

34	1 mark for each part Or For correct figure (i) In ΔACB, M is the midpoint of AB and MD || BC	1

	D is the midpoint of AC (Converse of mid point theorem) (ii) ∠ACB = ∠ADM (Corresponding angles) also, ∠ACB = 90° ∠ADM = 90° and MD ⊥ AC (iii) In ΔAMD and ΔCMD, AD = CD (D is the midpoint of side AC) ∠ADM = ∠CDM (Each 90°) DM = DM (common) ΔAMD ≅ ΔCMD [SAS congruency] AM = CM [CPCT] also, AM = ½ AB (M is midpoint of AB) Hence, CM = MA = ½ AB	1 1 1 1
35	For making class interval continuous For class mark+ proper scaling frequency polygon	1 1+1/2 2 1/2
	Section E	
	Section E consists of 3 questions of 4 marks each	
36	a) degree is 2 , Quadratic polynomial b) Linear c) (2x+1), (2x-5) or 39195	½ +1/2 **1** 2
37	(a) Angle QPR = 90 degree (b) Triangle QPR is a right angled triangle $4r^2 = 64 + 36$ r = 5 cm OR Perimeter of circle = $2\pi r$ = 2 ×22/7 ×5 = 31.4 cm (c) Angle QSR = Angle QPR = 90 degree (Angle in the same segment)	1 2 1
38	i) $\sqrt{3} - \sqrt{2}$ ii) Rational iii) 22- $4\sqrt{28}$ Or $\frac{\sqrt{77} - \sqrt{35}}{6}$	**1** **1** 2