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LUCKNOW REGION
Class IX Supplementary Examination
2023-24 SUBJECT : MATHEMATICS

Marking Scheme

Q. No.	Solution	Marking Details
1	(b) $\frac{37}{300}$	1
2	(c) 1.5	1
3	(b) 85-100	1
4	(a) 288 π cubic cm	1
5	(c) 23	1
6	(c) 168^0	1
7	(b) definition	1
8	(a) 4 cm	1
9	(d) not defined	1
10	(c)infinitely many solutions	1
11	(a) SAS	1
12	(c) 105^0	1
13	(a) $7\sqrt{6}$	1
14	(d) 27	1
15	(a) 25^0	1
16	(c) 55^0	1
17	(a) 4	1
18	(b) 4	1
19	(c) Assertion (A) is true but reason (R) is false.	1
20	(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)	1
21	For correct representation For correct measurement	1 1
22	For correct value x=a putting Find b=0	1 1
23	For correct proof step by step marks provide Or Four every correct postulates	2 .5+.5+.5+.5
24	s = 16 cm, $s - a$ = (16 – 8) cm = 8 cm, $s - b$ = (16 – 11) cm = 5 cm, $s - c$ = (16 – 13) cm = 3 cm. for Heron's formula Therefore, area of the triangle = $8\sqrt{30}$ Sq.cm	.5 .5 1
25	$\angle$ POS = $\angle$ROQ = 105° (Vertically opposite angles) and $\angle$ SOQ = $\angle$ POR = 75° or Draw a line parallel to ST through point R $\angle$ QRS= 60	1 1 1 1
26	x=13, y=-7	1.5 1.5

27	$g(x) = 0$ $x^2 - 3x + 2 = 0$ $(x - 1)(x - 2) = 0$ Therefore $x = 1$ or $x = 2$ Show $f(1)= 0$ and $f(2) =0$	1.5 1.5

	Or Using factor find p(1)=0 (x-1) is a factor, divide polynomial by (x-1) Factors are (x-1)(x-10)(x-12)	 1 1 1	
28	For correct equations There are infinite lines Because infinite line can pass through given one point.	1 1 1	
29	$y + 55° = 180°$ (Interior angles on the same side of the of the transversal ED) Therefore, $y = 180° – 55° = 125°$ Again $x = y$ (AB || CD, Corresponding angles axiom) Therefore $x = 125°$ Now, since AB || CD and CD || EF, therefore, AB || EF. So, ∠ EAB + ∠ FEA = 180° (Interior angles on the same side of the transversal EA) Therefore, $90° + z + 55° = 180°$ Which gives $z = 35°$ OR 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, ∠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	 1 1 1 .5 .5 .5 .5 .5 .5	
30	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 1 . 1	
31	For correct identity VIII (I) -1260 (ii) 16380	1 1 1	
32	It is given that PS || QR and transversal p intersects them at points A and C respectively. The bisectors of ∠ PAC and ∠ ACQ intersect at B and bisectors of ∠ ACR and ∠ SAC intersect at D. We are to show that quadrilateral ABCD is a rectangle. Now, ∠ PAC = ∠ ACR (Alternate angles as l || m and p is a transversal) So,1/2∠ PAC =1/2∠ ACR	 1	

	i.e., ∠ BAC = ∠ ACD These form a pair of alternate angles for lines AB and DC with AC as transversal and they are equal also. So, AB ‖ DC Similarly, BC ‖ AD (Considering ∠ ACB and ∠ CAD) Therefore, quadrilateral ABCD is a parallelogram.	1 1 1

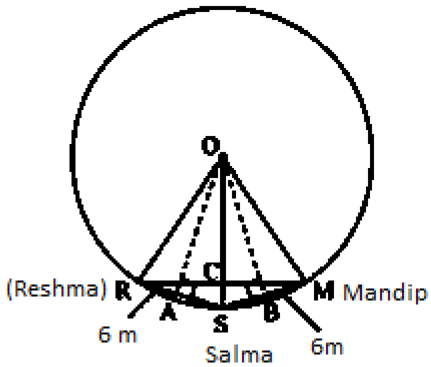
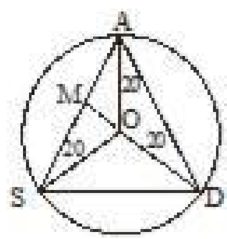
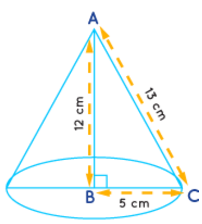
Also, ∠ PAC + ∠ CAS = 180° (Linear pair)
So, 1/2PAC +1/2CAS =1/2× 180° = 90° 1
or, ∠ BAC + ∠ CAD = 90° or, ∠ BAD = 90°
So, ABCD is a parallelogram in which one angle is 90°.
Therefore, ABCD is a rectangle.

OR

(i) In quadrilateral APCQ,
AP || QC (Since AB || CD) (1)
AP =1/2AB, 1
CQ =1/2CD (Given) 1
Also, AB = CD (reason) 1
So, AP = QC (2)
Therefore, APCQ is a parallelogram [From (1) and (2) and Theorem 8.8]
(ii) Similarly, quadrilateral DPBQ is a parallelogram, because 2
DQ || PB and DQ = PB

33 Draw perpendicular OA and OB on RS and SM respectively
AR=AS=16=3m
OR=OS=OM=5m. (Radii of the circle)
Using Pythagoras theorem, OA=4m
ORSM will be a kite (OR = OM and RS = SM).
We know that diagonals of a kite are
perpendicular and the diagonal common to both
the isosceles triangle is bisected by another
diagonal
∴∠RCS will be of 90∘ and RC=CM
Area of ΔORS=1/2×OA×RS=1/2×RC×OS
RM=2RC=2(4.8)=9.6
Therefore, the distance between Reshma and Mandip is 9.6 m.
OR
Let situation of Ankur, Syed and David be A, S and D respectively in the circular path.
OS = OD = OA = 20m
construction: Draw OM ⊥ SA
Now, AS = SD = AD
So, ASD is an equilateral triangle.
∠A=60∘
∠MAO=30∘
MO=AO/2
[In right angled triangle, the side opposite to 30∘ is half of hypotenuse]
MO=20/2=10
$AM^2=OA^2-OM^2=20^2-10^2$
400 - 100 = 300
AM=$\sqrt{300}$
AS=2AM=2$\sqrt{300}$
=2×10$\sqrt{300}$=20$\sqrt{300}$

34 (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

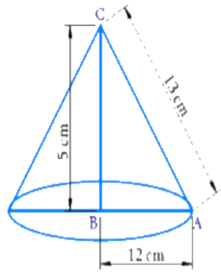
	Volume of the cone = $1/3\pi r^2 h$	2	
		 	
			

= 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' = $1/3\pi r^2h$

Radius of the cone, r =12cm

Height of the cone, h = 5cm

Volume of the cone = $1/3\pi r^2h$

= (1/3) × π × 12cm × 12cm × 5cm — 2

= 240π cm^3

(c) Ratio = Volume of the cone in (a)/ Volume of the cone in (b)

= 100π : 240π

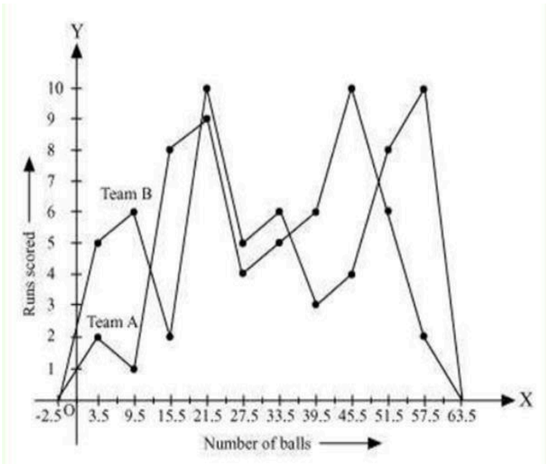
= 5 :12

The volume of the cone is 240π cm^3 and the required ratio is 5 :12 — 1

35 Continuous data with class mark of each class interval can be represented as follows. — 2.5+2.5

Number of balls	Class mark	Team A	Team B
0.5 - 6.5	3.5	2	5
6.5 - 12.5	9.5	1	6
12.5 - 18.5	15.5	8	2
18.5 - 24.5	21.5	9	10
24.5 - 30.5	27.5	4	5
30.5 - 36.5	33.5	5	6
36.5 - 42.5	39.5	6	3
42.5 - 48.5	45.5	10	4
48.5 - 54.5	51.5	6	8
54.5 - 60.5	57.5	2	10

By taking class marks on x-axis and runs scored on y-axis, a frequency polygon canbe constructed as follows.



36
- i. (4,6) — 1
- ii. (6,5) — 1
- iii. (3,-6) — 2

  or (-10,-3)

37
- i. x+y=500 — 1
- ii. x+2y=700 — 1
- iii. 300 birds — 2

  or 200 deers

38
- i. 480 m — 1
- ii. $600\sqrt{21}\ m^2$ — 1
- iii. $900\sqrt{3}\ m^2$ — 2

  or $300\sqrt{7}\ m^2$