BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS

SENIOR SECONDARY| CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL

ANNUAL EXAMINATIO- 2026

MATHEMATICS (041)

Class : IX Duration : **3 Hrs**

Date :20-02-2026

Max. Marks: **80**

MARKING SCHEME – (SET-I)

SECTION A

Each question carries 1 mark. (mcq)

1. $\sqrt{12}$ [C]
2. $7\sqrt{6}$ [B]
3. 0 [A]
4. Do not lie in any quadrant. [B]
5. 4 , 0 [C]
6. FIVE [C]
7. 126^0 [A]
8. 55^0 [D]
9. BD = CD [A]
10. 90^0 [A]
11. Supplementary [B]
12. 80^0 [A]
13. $100\sqrt{3}$ cm ^{2} [D]
14. $2\sqrt{14}$ [B]
15. $\frac{32}{3}\pi R^3$ [D]
16. 16π [A]
17. 2.8 [D]
18. None of these [D]
19. [A]
20. [A]

SECTION B

21. $2x^2 + 7x + 3. = 2x^2 + 6x + x + 3$ — 1
$= 2x(x + 3) + 1(x + 3)$ — ½
$= (2x + 1)(x + 3)$ — ½

22. $2x + 3y = k$
$2(8) + 3(3) = k$ — 1
$16 + 9 = k$ — ½
$25 = k$ — ½

23. if AC = BD, then prove that AB = CD
AC = BD
AC - BC = BD - BC — 1
AB = CD — 1

24 : AC = BC ------- given — ½
∠PAC = ∠PCB -------- Each 90° — ½
PC = PC -------- Common — ½

$\Delta APB \cong \Delta BPC$ -------- SAS congruence rule ½

PA = PB CPCT ½

OR

x + 45 + 30 = 360° 1

x = 360 ^{0} – 75^0 ½

x = 285° ½

25. Volume of Sphere = $\frac{4}{3}$ x $\frac{22}{7}$ x 7 x 7 x 7 ½

= 1

= 1437.3 cm ^{3} ½

OR

TSA of Cone = 3.14 x 12 (12 + 12) ½

= 3.14 x 12 x 24 ½

= 904.32 ½

SECTION C

26.: $\frac{1}{7+3\sqrt{2}}$ x $\frac{7-3\sqrt{2}}{7-3\sqrt{2}} = \frac{7-3\sqrt{2}}{(7)^2-(3\sqrt{2})^2}$ 1

$= \frac{7-3\sqrt{2}}{49-18}$ ½

$= \frac{7-3\sqrt{2}}{31}$ ½

ii) $(3 + \sqrt{3})(3 - \sqrt{3}) = (3)^2 - (\sqrt{3})^2$ ½

= 6 ½

27. 3x + y = 7 ½

y = 7 – 3x 2 ½

x		0	1	2	-1	3	4
y		7	4	1	10	-2	-5

OR

If $x = k^2$ and $y = k$ is a solution of the equation $x - 5y + 6 = 0$ Find the value of k

$k^2 - 5k + 6 = 0$

$k^2 - 3k - 2k + 6 = 0$ 1

$k(k-3) - 2(k-3) = 0$ 1

k = 3 , 2 1

28. i) Expand using identities : $(3a - 7b - c)^2$

$= (3a)^2 + (-7b)^2 + (-c)^2 + 2 \times 3a \times -7b + 2\ -7b \times -c + 2 - c \times 3a$ 1

$= 9a^2 + 49b^2 + c^2 - 42ab + 14bc - 6ca$ ½

ii) $8a^3 + b^3 + 12a^2b + 6ab^2 = (2a)^3 + (b)^3 + 2(2a)^2 b + 2 \times 2a (b)^2$ 1

= (2a +b) 3 ½

29. Graph - 2 ½

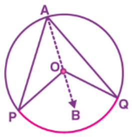
Rectangle - ½

30. Given: A circle with centre O

To Prove: ∠POQ = 2∠PAQ

Proof: join AO and extend it to point B.

Case 1:



Consider a triangle APO,

OA = OP (Radii)

∠OPA = ∠OAP ……………..(1)

By using the exterior angle property (exterior angle is the sum of interior opposite angles),

∠BOP = ∠OAP + ∠OPA

By using (1),

∠BOP = ∠OAP + ∠OAP

∠BOP = 2∠OAP… ……………(2) 1

In triangle AQO,

OA = OQ (Radii)

∠OQA = ∠OAQ … ……………(3) 1

∠BOQ = 2∠OAQ ……………..(4)

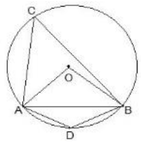
Adding (2) and (4) we get,

∠POQ = 2∠PAQ. 1

OR

The chord AB is equal to the radius of the circle.

AB = OA = OB = radius of the circle ½



∠AOC = 60° ½

And, ∠ACB = ½ ∠AOB

∠ACB = ½ × 60° = 30° ½

Now, since ACBD is a cyclic quadrilateral, ½

∠ADB +∠ACB = 180° (They are the opposite angles of a cyclic quadrilateral) ½

∠ADB = 180°-30° = 150° ½

31.: Graph: For correct construction of Polygon 2 ½

For labelling ½

SECTION D

32. It is given that ΔABC and ΔDBC are two isosceles triangles.

(i) ΔABD and ΔACD are similar by SSS congruency because: ½

AD = AD (It is the common arm)

AB = AC (Since ΔABC is isosceles) ½

BD = CD (Since ΔDBC is isosceles) ½

∴ ΔABD ≅ ΔACD.

ii) In ΔABP and ΔACP:

AP = AP (It is the common side) ½

∠PAB = ∠PAC (by CPCT since ΔABD ≅ ΔACD)

AB = AC (Since ΔABC is isosceles)

ΔABP ≅ ΔACP by SAS congruency condition. ½

∠PAB = ∠PAC by CPCT as ΔABD ≅ ΔACD.

AP bisects ∠A. — (i) ½

In ΔBPD and ΔCPD

PD = PD (It is the common side) ½

BD = CD (Since ΔDBC is isosceles.)

BP = CP (by CPCT as ΔABP ≅ ΔACP) ½

ΔBPD ≅ ΔCPD.

∠BDP = ∠CDP by CPCT. — (ii) ½

From (i) and (ii) it can be said that AP bisects ∠A as well as ∠D. ½

OR

So, DB ∥ AC ...(*i*)

We have AC ⊥ BC ...(*ii*) [Given]

So, DB ⊥ BC [From (*i*) and (*ii*)] 1

i.e., ∠DBC is a right angle, *i.e.,* ∠DBC = 90°.

(*i*) Consider triangles AMC and DMB,

We have AM = BM [Given]

CM = DM [Given] 1

and ∠AMC = ∠BMD [Vertically opposite angles]

∴ Δ AMC ≅ Δ BMD [SAS rule]

(*ii*) As ∠BAC = ∠DBA [CPCT, from part (*i*)]

and AB is the transversal. 1

(*iii*) Consider triangles ABC and DCB.

We have AC = DB [Since ΔAMC ≅ ΔBMD; result (*i*)]

BC = CB [Common] 1

and ∠ACB = ∠DBC [Each 90°]

∴ Δ DBC ≅ Δ ACB [SAS rule]

(*iv*) As DC = AB [CPCT from part (*iii*)]

⇒ 2CM = AB [∵ M is mid-point of DC]

⇒ $CM = \frac{1}{2}AB.$ 1

33. i) In ΔAPD and ΔCQB,

DP = BQ (Given)

∠ADP = ∠CBQ (Alternate interior angles)

AD = BC (Opposite sides of a parallelogram)

Thus, ΔAPD ≅ ΔCQB [SAS congruency]

(ii) AP = CQ by CPCT as ΔAPD ≅ ΔCQB.

(iii) In ΔAQB and ΔCPD,

BQ = DP (Given)

∠ABQ = ∠CDP (Alternate interior angles)

AB = CD (Opposite sides of a parallelogram)

Thus, ΔAQB ≅ ΔCPD [SAS congruency]

(iv) As ΔAQB ≅ ΔCPD

AQ = CP [CPCT]

34. Let a = 16 m, b =20 m, c = 12 m

$S = \frac{16+12+20}{2}$ ½

S = 24 m

Area = $\sqrt{s(s-a)(s-b)(s-c)}$ ½

$= \sqrt{24} \times 8 \times 12 \times 4$ 1

$= \sqrt{4} \times 2 \times 3 \times 4 \times 2 \times 4 \times 3 \times 4$ 1

$= 96\ m^2$ 1

Cost of levelling the ground = 96 x 4 ½

= Rs 384 ½

35. $4 \pi r^2 = 5 \times \pi r l$ ½

Slant ht (l) = $\frac{100 \pi}{20 \pi}$ ½

= 5 cm ½

$l^2 = r^2 + h^2$ ½

h = 3 cm 1

Volume = $\frac{1}{3} \times 3.14 \times 4 \times 4 \times 3$ ½

= 3.14 x 16 ½

$= 50.24\ cm^2$ ½

OR

Volume of the solid sphere = $\frac{4}{3} \pi r^3$ ½

Volume of twenty seven solid sphere = 27× (4/3) πr3 = $36 \pi r^3$ ½

(i) New solid iron sphere radius = r'

Volume of this new sphere = $(4/3) \pi (r')^3$ ½

$(4/3) \pi (r')^3 = 36 \pi r^3$ ½

$(r')^3 = 27r^3$

r'= 3r ` ½

Radius of the new sphere will be 3r (thrice the radius of the original sphere)

(ii) Surface area of the iron sphere of radius r, S $=4\pi r^2$ ½

Surface area of the iron sphere of radius r'= $4\pi (r')^2$ ½

S/S' = $(4\pi r^2) \div (4\pi (r')^2)$ ½

S/S' = $r^2/(3r')^2 = 1/9$

The ratio of S and S' is 1: 9. ½

36. i) Radius = 5 m 1

ii) 90^0 1

iii) 12 m 2

Or

$24\ m^2$ 2

37.

i) $y = \frac{180 - 60}{5}$ 2

$y = \frac{120}{5}$

$y = 24^o$

OR

x + y + 60 = 180

x = 180 – 84

$x = 96^o$

ii) $z = \frac{180 - 96}{2}$ 1

$z = \frac{84}{2}$

z = 42

iii). $x + z = 96 + 42$ 1

$= 138^o$

38. i) 10 1

ii) 60 1

iii) 50 % of marks= 30 marks

No of students 50 % and above= 19 + 7 + 1= 27 2

OR

No of students less than 50 % = 21 + 10 + 2 = 33

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