# B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL

## MATHEMATICS

Class : IX
Date : 05-09-2025

**MARKING SCHEME**

Duration: **3 Hrs**
Max. Marks: **80**

### SECTION A

**Each question carries 1 mark. ( mcq)**

**1.** Irrational [C]
**2.** $2\sqrt{3} + 3\sqrt{2}$ [C]
**3.** None of these [D]
**4.** $8\sqrt{3}cm^2$ [A]
**5.** 4 [A]
**6.** 4 [B]
**7.** Linear Polynomial [C]
**8.** Linear Pair [A]
**9.** $55^0$ [B]
**10.** $36^0$ , $54^0$ , $90^0$ [A]
**11.** $x$ - axis [D]
**12.** 6 [A]
**13.** 5,5 [C]
**14.** $\sqrt{23}$ [A]
**15.** $100\sqrt{3}$ [D]
**16.** BE = CF [C]
**17.** ASA [B]
**18.** $50^0$ [C]
**19.** [A]
**20.** [A]

### SECTION B

**21.** i) $(\sqrt{5} + \sqrt{2})^2 = 5 + 2\sqrt{10} + 2$ ½

$= 7 + 2\sqrt{10}$ ½

ii) $(125)^{-1/3} = (5^3)^{-1/3}$ ½

$= \frac{1}{5}$ ½

**22.** : $(\frac{3x}{2} + 1)^3 = (\frac{3x}{2})^3 + (1)^3 + 3(\frac{3x}{2})^2 \times 1 + 3(\frac{3x}{2}) \times (1)^2$ 1

` $= = (\frac{27x\ ^\wedge 3}{8}) + 1 + \frac{27}{4} x^2 + (\frac{9x}{2})$ 1

OR

$(102)^3 = (100 + 2)^3$ ½

$= (100)^3 + (2)^3 + 3 \times (100)^2 \times 2 + 3 \times 100 (2)^2$ ½

= 1000000 + 8 + 6 0000 + 1200 ½

= 1061208

**23.** $2x + 3x = 90$ ½

$x = 18$

a = $36^0$ , b = $54^0$ ½

c = 180 – 54 ½

c = $126^0$ ½

**24.** From x – axis = 2 1

From y – axis = 5 1

OR

( -2 , 4 ) – II Quadrant , ( 3 , - 1 ) IV Quadrant 1

( 4 , 4 ) – I Quadrant , ( -1 , 0 ) - x - axis

( -1 , -1 ) – III Quadrant and ( 0 , 10 )- y- axis 1

**25.** p $(x) = x^4 + x^3 + x^2 + x + 1$

p ( -1 ) = $(-1)^4 + (-1)^3 + (-1)^2 + (-1) + 1$ 1

= 1 – 1 + 1 – 1 + 1 ½

= 1 ½

## SECTION C

**26.** a) 0. $\overline{001}$ = 0.001001001

$x$ = 0.00100100 --------- (i) ½

1000 $x$ = 1.001100100 ------- (ii) ½

$x = \frac{1}{999}$ ½

b) SIX rational numbers between 3 and 4.

$\frac{3 \times 8}{1 \times 8} = \frac{24}{8}$ and $\frac{4 \times 8}{1 \times 8} = \frac{32}{8}$ 1

$\frac{25}{8}, \frac{26}{8}, \frac{27}{8}, \frac{28}{8}, \frac{29}{8}, \frac{30}{8}$ ½

**27**. i) $(x + 5)(x + 7) = x^2 + (5 + 7)x + 5 \times 7$ 1

$= x^2 + 12x + 35$ ½

ii ) $(3x + 4)(3x - 4) = (3x)^2 - (4)^2$ 1

$= 9x^2 - 16$ ½

**28**. $6x^2 + 5x - 6 = 6x^2 + 9x - 4x - 6$ 1

$= 3x(2x + 3) - 2(2x + 3)$ 1

$= (3x - 2)(2x + 3)$ 1

OR

i) $(x + 5)(x - 10) = x^2 - 5x - 50$ 1½

ii) $(\frac{5}{4} + \frac{y}{3})(\frac{5}{4} - \frac{y}{3})$ 1½

**29**. $\angle AGE = \angle GED$ alternate angles ½

$\angle AGE$ = $126^0$ ½

$\angle GED$ = $\angle GEF + \angle FED$ ½

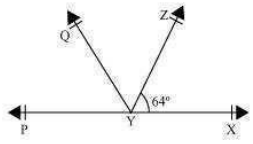
126- 90 = $\angle GEF$ ½

36 $^0$ = $\angle GEF$

$\angle FGE$ = 180 – 126 linear pair ½

= 54 $^0$ ½

**OR**




∠XYZ + ∠ZYP = 180 $^0$ ½

∠ZYP = 180 – 64 ½

∠ZYP = 116 $^0$

$\angle ZYQ = \angle QYP = \frac{116}{2}$ ½

= 58 $^0$

∠XYQ = 65 + 58 ½

= 122 $^0$ ½

Reflex $\angle QYP$ = 360- 58

= 302 $^0$ ½

**30.** For correct Graph question 2 ½

Name of the figure ½

**31.** In Δ BOC and Δ AOD ½

BC = AD Given ½

∠ OBC = ∠ OAD Each 90 $^0$ ½

∠ BOC = ∠ AOD Vertically Opposite Angles ½

Δ BOC ≅ Δ AOD AAS Congruence rule ½

**SECTION D**

**32.** $3x + 5x + 7x$ = 300 ½

$x$ = 20 ½

Semi perimeter = $\frac{300}{2}$ ½

= 150 m ½

Area = $\sqrt{150 \times 90 \times 50 \times 10}$ 1

= $\sqrt{30 \times 50\ 30 \times 3 \times 25 \times 2 \times 5 \times 2}$ 1

= 1500 $\sqrt{3}$ cm $^2$ ½

**33.** $x$ = 180 – 120 1 ½

= 60 $^0$ ½

$y$ = 180 – 140 $^0$ 1 ½

= 40 $^0$ ½

$z$ = 60 vertically opposite angles ½

$a$ = 80 $^0$ ½

**34.** $\frac{\sqrt{11}-\sqrt{7}}{\sqrt{11}+\sqrt{7}} = \frac{\sqrt{11}-\sqrt{7}}{\sqrt{11}+\sqrt{7}} \times \frac{\sqrt{11}-\sqrt{7}}{\sqrt{11}-\sqrt{7}}$ 1

$= \frac{(\sqrt{11}-\sqrt{7})^2}{\left((\sqrt{11})-(\sqrt{7})^2\right)}$ 1½

$= \frac{11-2\sqrt{77}+7}{11-7}$ 1

$= \frac{18-2\sqrt{77}}{4}$ 1

**OR**

$(\frac{81}{16})^{-3/4}\left[(\frac{25}{9})^{-3/2} \div (\frac{5}{2})^{-3}\right] = (\frac{3}{2})^{4 \times -3/4}\left[(\frac{5}{3})^{2 \times -3/2} \times (\frac{5}{2})^{3}\right]$ 1½

$= (\frac{2}{3})^{3}\left[(\frac{3}{5})^{3} \times (\frac{2}{5})^{3}\right.$ 1½

$= \frac{8}{27} \times \frac{27}{125} \times \frac{125}{8}$ 1

$= 1$ 1

**35.** P is the mid-point of AB.

$\therefore$ AP = BP ½

$\angle EPA = \angle DPB$ [Given]

Adding $\angle EPD$ on both sides, we get

$\angle EPA + \angle EPD = \angle DPB + \angle EPD$ 1

$\angle APD = \angle BPE$ ½

**In ΔDAP and ΔEBP,**

$\angle PAD = \angle PBE$ [$\because \angle BAD = \angle ABE$] ½

AP = BP [Proved above]

$\angle DPA = \angle EPB$ [Proved above] 1

$\therefore$ ΔDAP ≅ ΔEBP [By ASA congruency] ½

AD = BE [By C.P.C.T.] ½

**OR**

In ΔAMC and ΔBMD, we have

CM = DM [Given] ½

$\angle AMC = \angle BMD$ [Vertically opposite angles]

AM = BM [Proved above] ½

$\therefore$ ΔAMC ≅ ΔBMD [By SAS congruency]

$\angle MAC = \angle MBD$ [By C.P.C.T.] ½

But they form a pair of alternate interior angles.

$\therefore$ AC || DB

$\therefore \angle BCA + \angle DBC = 180°$ [Co-interior angles] ½

But $\angle BCA = 90°$ [ΔABC is right angled at C]

$\therefore 90° + \angle DBC = 180°$ ½

$\angle DBC = 90°$

In ΔDBC and ΔACB, we have

BD = CA ---Proved above ½

$\angle DBC = \angle ACB$ [Each 90°] ½

BC = CB [Common]

$\therefore$ ΔDBC ≅ ΔACB -------By SAS congruency ½

**36.** i) Semi perimeter ( S) = $\frac{3a}{2}$ 1

ii ) Each side = $\frac{180}{3}$ = 60 cm 2

OR

Area = 2025 $\sqrt{3}$ cm $^2$ 2

iii) Area = $\frac{\sqrt{3}}{4}$ ( side )$^2$ 1

**37.** i) Coordinates ( 3 , 4 ) 2

OR,

Coordinates (-4, -4 ) 2

ii) $x - axis$ 1

iii) -3 1

**38.** i) $\angle 1 = \angle 4$ Alternate angles 1

ii) 180 $^0$- Angles on a line 2

OR

$\angle 3$ = 180 – 125 = 55 $^0$ 2

iii) Yes , Exterior angle property 1.

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