



# B.K. BIRLA CENTRE FOR EDUCATION

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



## PRE MID TERM 2025-26 MARKING SCHEME-MATHEMATICS

Class: X  
Date: 07/08/25  
Admission no:

Time: 1hr  
Max Marks: 25  
Roll no:

### General Instructions:

1. This Question Paper has 4 Sections A, B, C and D.
2. Section A has 5 MCQs carrying 1 mark each
3. Section B has 2 questions carrying 02 marks each.
4. Section C has 2 questions carrying 03 marks each.
5. Section D has 2 questions carrying 05 marks each.
6. All Questions are compulsory.

### SECTION A

- |    |   |    |
|----|---|----|
| 1. | If a pair of linear equations is consistent, then the lines will be                                       | 1m |
|    | (a) always coincident      (b) parallel      (c) always intersecting      (d) intersecting or coincident  |    |
| 2. | The graph of $x = -2$ is a line parallel to the   | 1m |
|    | (a) x-axis      (b) y-axis      (c) both x- and y-axis      (d) None of these                             |    |
| 3. | The sum of the roots of the quadratic equation $3x^2 - 9x + 5 = 0$ is                                     | 1m |
|    | (a) 3      (b) 6      (c) -3      (d) None of these   |    |
| 4. | If $\alpha$ and $\beta$ are the roots of $4x^2 + 3x + 7 = 0$ , then the value of $\alpha \times \beta$ is | 1m |
|    | (a) $4/3$ (b) $3/4$ (c) $7/4$ (d) None of these   |    |
| 5. | If the roots of $px^2 + qx + 2 = 0$ are reciprocal of each other, then                                    | 1m |
|    | (a) $p = -2$ (b) $p = 2$ (c) $p = 3$ (d) None of these  |    |

## SECTION B

6. Solve the following pair of linear equations for x and y: 2m

$$141x + 93y = 189$$

$$93x + 141y = 45$$

A:-

Solution:

$$\begin{array}{r} 141x + 93y = 189 \\ 93x + 141y = 45 \\ \hline 234x + 234y = 234 \end{array} \quad \begin{array}{l} \text{---[By adding} \\ \text{...(i) (* by 234)} \end{array}$$

$$\Rightarrow x + y = 1$$

Again

$$\begin{array}{r} 141x + 93y = 189 \\ 93x + 141y = 45 \\ \hline 48x - 48y = 144 \end{array} \quad \begin{array}{l} \text{---[By subtracting} \\ \text{...(ii) (* by 48)} \end{array}$$

$$\Rightarrow x - y = 3$$

By adding (i) and (ii), we get

$$\begin{array}{r} x + y = 1 \quad \text{...(i)} \\ x - y = 3 \quad \text{...(ii)} \\ \hline 2x = 4 \end{array} \quad \Rightarrow \quad x = 2$$

$$2x = 4 \quad \Rightarrow \quad x = 2$$

Putting the value of x in (i), we get

$$\begin{array}{l} 2 + y = 1 \\ y = 1 - 2 = -1 \end{array} \quad \therefore \quad x = 2, y = -1$$

1m

1m

7. If -5 is a root of the quadratic equation  $2x^2 + px - 15 = 0$  and the quadratic equation  $p(x^2 + x) + k = 0$  has equal roots, find the value of k. 2m

A:-

We have,  $2x^2 + px - 15 = 0$

Since (-5) is a root of the given equation

$$\therefore 2(-5)^2 + p(-5) - 15 = 0$$

$$\Rightarrow 2(25) - 5p - 15 = 0$$

$$\Rightarrow 50 - 15 = 5p$$

$$\Rightarrow 35 = 5p \Rightarrow p = 7 \quad \text{...(i)}$$

Now,  $p(x^2 + x) + k \Rightarrow px^2 + px + k = 0$

$$7x^2 + 7x + k = 0 \quad \text{...[From (i)]}$$

Here,  $a = 7, b = 7, c = k$

$D = 0$  ...[Roots are equal]

$$b^2 - 4ac = 0$$

$$\Rightarrow (7)^2 - 4(7)k = 0 \Rightarrow 49 - 28k = 0$$

$$\Rightarrow 49 = 28k \therefore k = \frac{49}{28} = \frac{7}{4}$$

1m

1m

## SECTION C

8. The sum of the digits of a two digit number is 8 and the difference between the number and that formed by reversing the digits is 18. Find the number. 3m

- A:-** Solution:  
 Let unit and tens digit be  $x$  and  $y$ .  
 $\therefore$  Original number =  $1x + 10y$  ... (i)  
 Reversed number =  $10x + 1y$   
 According to question,  
 $x + y = 8$  1m  
 $\Rightarrow y = 8 - x$  ... (ii)  
 Also,  $1x + 10y - (10x + y) = 18$   
 $\Rightarrow x + 10y - 10x - y = 18$  1m  
 $\Rightarrow 9y - 9x = 18$   
 $\Rightarrow y - x = 2$  ... [Dividing both sides by 9]  
 $\Rightarrow 8 - x - x = 2$  ... [From (ii)]  
 $\Rightarrow 8 - 2 = 2x$   
 $\Rightarrow 2x = 6$   
 From (ii),  $y = 8 - 3 = 5$  1m  
 From (i), Original number =  $3 + 10(5) = 53$

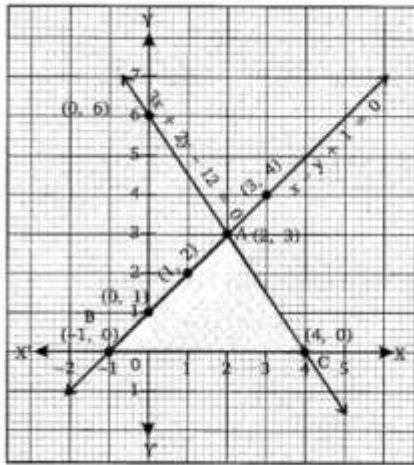
- 9. Find the value(s) of  $k$  so that the quadratic equation  $3x^2 - 2kx + 12 = 0$  has equal roots** 3m

- A:-** Given:  $3x^2 - 2kx + 12 = 0$   
 Here  $a = 3$ ,  $b = -2k$ ,  $c = 12$   
 $D = 0$  ... [Since roots are equal As]  
 $b^2 - 4ac = 0$  2m  
 $\therefore (-2k)^2 - 4(3)(12) = 0$   
 $\Rightarrow 4k^2 - 144 = 0 \Rightarrow k^2 = \frac{144}{4} = 36$   
 $\therefore k = \pm\sqrt{36} = \pm 6$  1m

### SECTION D

- 10. Draw the graphs of the equations  $x - y + 1 = 0$  and  $3x + 2y - 12 = 0$ . Determine the coordinates of the vertices of the triangle formed by these lines and the  $x$ -axis, and shade the triangular region.** 5m

- A:-** Given:  $x - y + 1 = 0$  ... (i)  
 $3x + 2y - 12 = 0$  ... (ii)  
 From equation (i), we have:  
 $y = x + 1$   
 When  $x = 0$ , then  $y = 0 + 1 = 1$   
 When  $x = 1$ , then  $y = 1 + 1 = 2$   
 When  $x = 2$ , then  $y = 2 + 1 = 3$   
 When  $x = -1$ , then  $y = -1 + 1 = 0$   
 Thus, we have the following table of solutions:
- |     |   |   |   |    |
|-----|---|---|---|----|
| $x$ | 0 | 1 | 2 | -1 |
| $y$ | 1 | 2 | 3 | 0  |
- 2m
- Now from equation (ii), we have:  
 $y = \frac{12 - 3x}{2}$   
 When  $x = 0$ , then  $y = \frac{12 - 0}{2} = 6$   
 When  $x = 2$ , then  $y = \frac{12 - 6}{2} = 3$   
 When  $x = 4$ , then  $y = \frac{12 - 12}{2} = 0$   
 Thus, we have the following table of solutions:
- |     |   |   |   |
|-----|---|---|---|
| $x$ | 0 | 2 | 4 |
| $y$ | 6 | 3 | 0 |
- Plotting the points on a graph paper, we get the shaded triangle ABC with vertices A(2, 3), B(-1, 0) and C(4, 0). 1m



2m

11. A train travels a distance of 480 km at a uniform speed, if the speed had been 8 km per hour less, then it would have taken three hours more to cover the same distance .Find the speed of the train

5m

A:-

Total distance to be covered = 480 km

$$\text{Time} = \frac{\text{distance}}{\text{speed}} = \frac{480}{x}$$

Decreased speed of the train =  $(x - 8)$  km/h

Now,  $\text{Time} = \frac{480}{x - 8}$

2m

According to question,

$$\frac{480}{x - 8} - \frac{480}{x} = 3 \quad \Rightarrow \quad 480 \left[ \frac{1}{x - 8} - \frac{1}{x} \right] = 3$$

$$\Rightarrow \quad 480 \left[ \frac{x - x + 8}{x(x - 8)} \right] = 3 \quad \Rightarrow \quad 480 \times 8 = 3x(x - 8)$$

$$\Rightarrow \quad 3840 = 3x^2 - 24x \quad \Rightarrow \quad 3x^2 - 24x - 3840 = 0$$

2m

$$\Rightarrow \quad x^2 - 8x - 1280 = 0$$

Which is the required quadratic equation.

After solving  $x = 40$  km/hr

1m

\*\*\*\*BEST OF LUCK\*\*\*\*