

A & C 6-6, Mumbai

Class - X

Maths

Ch 3 Answer Key

Section A

1. (d) 2. (c)

3. $a + b = 5$, $2a - 3b = 4$
 $3a + 3b = 15$.

$$a = \frac{19}{5} \quad b = \frac{6}{5} \quad (d)$$

4. (d)

$$5. \frac{3}{2k-1} = \frac{1}{k-1} \neq \frac{1}{2k+1}$$

$$3k - 3 = 2k - 1.$$

$$k = \underline{\underline{2}} \quad (d)$$

$$6. \frac{1}{2} \times 5 \times 3 = 7.5 \text{ sq units } (b)$$

7. -2 (a)

$$8. (d) \quad 9. (e) \quad 10. (b)$$

$$11. (a) \quad 12. (b)$$

Section B

$$1. \quad x - y + 1 = 0 \rightarrow \textcircled{1}$$

$$4x + 3y - 10 = 0 \rightarrow \textcircled{2}$$

$$\text{From } \textcircled{1} \quad x = y - 1.$$

$$4(y - 1) + 3y - 10 = 0$$

$$7y - 14 = 0 \Rightarrow y = \underline{\underline{2}}$$

$$x - 2 + 1 = 0 \Rightarrow x = \underline{\underline{1}}$$

$$2. \quad x - y + 1 = 0 \rightarrow \textcircled{1}$$

$$4x + 3y - 10 = 0 \rightarrow \textcircled{2}$$

$$\textcircled{1} \times 3 \rightarrow 3x - 3y + 3 = 0 \rightarrow \textcircled{3}$$

$$\textcircled{2} + \textcircled{3}, \quad 7x - 7 = 0 \Rightarrow x = 1$$

$$1 - y + 1 = 0 \Rightarrow y = 2$$

$$3. \quad \frac{k}{1} = \frac{1}{k} = \frac{k^2}{1}$$

$$k^2 = 1, \quad k^3 = 1.$$

$$\therefore k = \underline{\underline{1}}.$$

$$4. \quad 3 - 4 + p = 0 \Rightarrow p = 1$$

$$6 + 1 - q - 2 \Rightarrow q = 5$$

$$5. \quad \begin{array}{l} x + y = 30 \\ x - y = 14 \end{array} \quad \left(\begin{array}{l} \text{opp sides of} \\ \text{a rectangle are} \\ \text{equal} \end{array} \right)$$
$$2x = 44 \quad x = \underline{\underline{22}}.$$
$$y = \underline{\underline{8}}.$$

$$6. \quad \begin{array}{l} 51x + 23y = 116 \rightarrow \textcircled{1} \\ 23x + 51y = 106 \rightarrow \textcircled{2} \end{array}$$

$$\textcircled{1} - \textcircled{2}$$

$$28x - 28y = 10$$

$$x - y = \frac{10}{28} = \frac{5}{14}$$

$$7. \quad \begin{array}{l} 2(b) - 3(a) = 5 \\ -3a = 5 - 6 \end{array}$$

$$a = \frac{1}{3}$$

$$8. \quad \frac{3}{2} \neq \frac{2}{-3} \quad \frac{a_1}{a_2} \neq \frac{b_1}{b_2}$$

consistent

$$9. \quad \frac{2}{4} \neq \frac{3}{5} \quad \text{intersect at a point}$$

$$10. \quad -4x + y = 1 \rightarrow \textcircled{1}$$

$$6x - 5y = 9 \rightarrow \textcircled{2}$$

$$\textcircled{1} \times 5 \rightarrow -20x + 5y = 5 \rightarrow \textcircled{3}$$

$$② + ③ - 14x = 14 \quad x = 1,$$

$$y = 5.$$

Section C.

$$1. \quad 2x + 3y = 11 \rightarrow ①$$

$$x - 2y = -12 \rightarrow ②.$$

$$② \times 2$$

$$2x - 4y = -24 \rightarrow ③.$$

$$① - ③$$

$$7y = 35 \Rightarrow y = 5.$$

Sub $y = 5$ in ②.

$$x - 10 = -12$$

$$x = -2 //.$$

$$y = mx + 3$$

$$5 = m(-2) + 3$$

$$5 = -2m + 3$$

$$m = \underline{\underline{-1}}.$$

$$2. (i) \quad 6x - 11y = 20.$$

$$(ii) \quad 6x - 10y = 22$$

$$(iii) \quad 3x - 5y = 12$$

$$4. \quad 6ax + 6by = 3a + 2b \rightarrow ①$$

$$6bx - 6ay = 3b - 2a \rightarrow ②$$

$$① \times b \quad \text{and} \quad ② \times a$$

$$6abx + 6b^2y = 3ab + 2b^2 \rightarrow ③$$

$$6abx - 6a^2y = 3ab - 2a^2 \rightarrow ④$$

$$③ - ④$$

$$6(a^2 + b^2)y = 2(a^2 + b^2)$$

$$6y = 2.$$

$$y = \frac{1}{3}$$

$$\text{Sub. } y = \frac{1}{3} \text{ in } \textcircled{1}.$$

$$6ax + 6b \times \frac{1}{3} = 3a + 2b$$

$$6ax + 2b = 3a + 2b.$$

$$x = \frac{1}{2}.$$

$$5. y = mx + 1$$

$$3x + 4y = 9.$$

$$3x + 4(mx + 1) = 9.$$

$$3x + 4mx + 4 = 9$$

$$3x + 4mx = 5.$$

$$x(3 + 4m) = 5$$

$$x = \frac{5}{3 + 4m}$$

$\therefore x$ is an integer

$3 + 4m$ can be 1, -1, 5 or -5

$$\text{If } 3 + 4m = 1 \Rightarrow m = \frac{-2}{4}$$

$$m = -\frac{1}{2}$$

$$3 + 4m = -1 \Rightarrow m = -\frac{4}{4}$$

$$m = -1$$

$$3 + 4m = 5 \Rightarrow m = \frac{2}{4} = \frac{1}{2}$$

$$3 + 4m = -5 \Rightarrow m = \frac{-8}{4} = -2$$

$\therefore m$ has to be an integer $m = -1$ or -2

Section D.

1. Let the ages of Anu & Baiju be x & y

$$x - y = 3 \rightarrow \textcircled{1}$$

Let the ages of Anu's father & Baiju's sister be p and q .

$$p = 2x \rightarrow \textcircled{2}$$

$$y = 2q \rightarrow \textcircled{3}$$

$$p - q = 30 \rightarrow \textcircled{4}$$

From $\textcircled{1}$, $\textcircled{2}$, $\textcircled{3}$

$$\frac{p}{2} - 2q = 3 \rightarrow \textcircled{5}$$

$$\textcircled{4} \times 2$$

$$2p - 2q = 60 \rightarrow \textcircled{6}$$

$$\textcircled{5} - \textcircled{6}$$

$$\frac{p}{2} - 2p = -57$$

$$p - 4p = -114$$

$$-3p = -114$$

$$p = 38, \quad \therefore x = 19$$

$$y = 16$$

2. Let 1st friend have Rs. x &
2nd friend have Rs. y .

$$x + 100 = 2(y - 100)$$

$$x - 2y = -300 \rightarrow \textcircled{1}$$

$$y + 10 = 6(x - 10)$$

$$6x - y = 70 \rightarrow \textcircled{2}$$

$$\textcircled{1} \times 6$$

$$6x - 12y = -1800 \rightarrow \textcircled{3}$$

$$\textcircled{2} \quad - \quad \textcircled{3}$$

$$11y = 1870$$

$$y = \frac{1870}{11} = 170$$

$$x = 40$$

3. Let no. rows be x & no. of students in each row be y
no. of students - xy

$$(x-1)(y+3) = xy$$
$$xy - y + 3x - 3 = xy$$

$$3x - y = 3 \longrightarrow \textcircled{1}$$

$$(x+2)(y-3) = xy$$

$$xy + 2y - 3x - 6 = xy$$

$$-3x + 2y = 6 \longrightarrow \textcircled{2}$$

$$\textcircled{1} + \textcircled{2}$$

$$y = 9$$

Sub $y = 9$ in $\textcircled{1}$

$$3x - 9 = 3$$

$$3x = 12$$

$$x = 4$$

no. of students - 36

4. Let x be the number of lions and y be the number of peacocks.

1 lion - 4 legs 1 peacock - 2 legs
 x lions - $4x$ legs y peacocks - $2y$ legs

$$x + y = 47 \rightarrow \textcircled{1}$$

$$4x + 2y = 152 \rightarrow \textcircled{2}$$

$$\textcircled{1} \times 2$$

$$2x + 2y = 94 \rightarrow \textcircled{3}$$

$$2x = 58 \quad x = 29$$

$$y = 18.$$

5. Let x be length &
 y be breadth

$$(x+5)(y-4) = xy - 160$$

$$xy + 5y - 4x - 20 = xy - 160$$

$$-4x + 5y = -140$$

$$4x - 5y = 140 \rightarrow \textcircled{1}$$

$$(x-10)(y+2) = xy - 100$$

$$xy - 10y + 2x - 20 = xy - 100$$

$$2x - 10y = -80 \rightarrow \textcircled{2}$$

$$\textcircled{1} \times \textcircled{2}$$

$$8x - 10y = 280 \rightarrow \textcircled{3}$$

$$\textcircled{2} - \textcircled{3}$$

$$-6x = -360$$

$$x = 60$$

$$240 - 5y = 140$$

$$5y = 100 \quad y = 20$$

Section 8

1. (i) Let x be the no. of answers he knew and y be

the number of answers he guessed. \therefore guesses were wrong
marks obtained for them $\rightarrow -\frac{y}{4}$.

marks obtained by knowing
 $\rightarrow x$.

$$x + y = 120 \rightarrow \textcircled{1}$$

$$x - \frac{y}{4} = 90 \rightarrow \textcircled{2}$$

$$\textcircled{1} - \textcircled{2}$$

$$\text{(ii)} \quad \frac{5y}{4} = 30$$

$$y = \frac{30 \times 4}{5} = 24$$

$$\text{(iii)} \quad x - 6 = 90 \quad x = 96$$

2. Let digit in ones place be x
and digit in tens place be y
number $\rightarrow 10y + x$

reversed no. $\rightarrow 10x + y$.

(i) 1st condition $x = 2y \rightarrow \textcircled{1}$.

2nd condition

$$10x + y - 10y - x = 27$$

$$9x - 9y = 27$$

$$x - y = 3 \rightarrow \textcircled{2}$$

From $\textcircled{1}$, $\textcircled{2}$.

$$y = 3$$

$$x = 6$$

(ii) original number 36

(iii) reversed number 63