

Q.1 Solve the following questions (9th std)

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- 1) For the following numbers write the ratio of first number to second number in the reduced form: 138, 161
- 2) For the following numbers write the ratio of first number to second number in the reduced form: 114, 133
- 3) Write the following ratios in the reduced form.
Radius to the diameter of a circle.
- 4) From the following pairs of numbers, find the reduced form of ratio of first number to second number: 38, 57
- 5) From the following pairs of numbers, find the reduced form of ratio of first number to second number: 52, 78

Q.2 Solve the following questions (9th std)

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- 1) Compare the following pair of surds: $\sqrt{247}$, $\sqrt{274}$
- 2) Write the following surds in simplest form.

$$-\frac{5}{9}\sqrt{45}$$

Q.3 Choose the correct alternative answer for each of the following questions:

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- 1) Following is the set of values of 'x' and 'y' for two linear equations in two variables, the solution of equations is :

x	1	5	-3	6
y	2	1	-3	0

x	1	-5	0	6
y	-4	1	-3	0

- (a) (6, 0) (b) (-3, -3) (c) (-5, 1) (d) (5, -1)
- 2) If x and y are tens and unit's place digits of a two digit number, then the expression representing following condition is : Sum of a two digit number and its reversible number is 88
 - (a) $10x + 10y = 88$
 - (b) $(10x + y) + (10y + x) = 88$
 - (c) $x + 10 + y = 88$
 - (d) $11x - 11y = 88$
 - 3) 8 girls and 12 boys can finish work in 10 days while 6 girls and 8 boys can finish it in 14 days. Frame linear equations for calculating time taken by the one girl alone (x) that by one boy alone (y) to finish the work.
 - a) $8\left(\frac{1}{x}\right) + 12\left(\frac{1}{y}\right) = \frac{1}{10}$; $6\left(\frac{1}{x}\right) + 8\left(\frac{1}{y}\right) = \frac{1}{14}$
 - b) $8x + 12y = 10$; $6x + 8y = 14$
 - c) $8\left(\frac{1}{x}\right) + 12\left(\frac{1}{y}\right) = 10$; $6\left(\frac{1}{x}\right) + 8\left(\frac{1}{y}\right) = 14$
 - d) $8x + 12y = \frac{1}{10}$; $6x + 8y = \frac{1}{14}$
 - 4) For what value of 'k', $2x + ky + 14 = 0$ have -2 as its y- intercept?
 - (a) 0 (b) -1 (c) 1 (d) 2
 - 5) Sum of two numbers is 25 and their difference is 7. Find the numbers.
 - (a) 16, -6 (b) 19, 6 (c) 17, 8 (d) 9, 16

- 6) Aruna has only Re1 and Re 2 coins in her piggy bank. If the total number of coins is 50 and the coins amount to Rs. 75. If 'x' be the number of Re1 coins and 'y' be the number of Re 2 coins, the equations so formed for the conditions are:
- (a) $x + 2y = 50$; $x + y = 75$
 - (b) $x + y = 50$; $x + 2y = 75$
 - (c) $x + y = 75$; $x + y = 50$
 - (d) $x - y = 50$; $x + 2y = 75$

Q.4 Solve the following questions (ANY FIVE)

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- 1) Solve the following simultaneous equations.
 $2x - 3y = 9$; $2x + y = 13$
- 2) Solve the following simultaneous equations.
 $5m - 3n = 19$; $m - 6n = -7$
- 3) Find the value of the following determinant.

$$\begin{vmatrix} 5 & 3 \\ 7 & 9 \end{vmatrix}$$

- 4) Find the value of the following determinant.

$$\begin{vmatrix} -8 & -3 \\ 2 & 4 \end{vmatrix}$$

- 5) Complete the following activity to solve the simultaneous equations.

$$5x + 3y = 9 \quad \dots\dots \text{(I)}$$

$$2x + 3y = 12 \quad \dots\dots \text{(II)}$$

Let's add equations (I) and (II).

$$\begin{array}{r} 5x + 3y = 9 \\ + 2x + 3y = 12 \\ \hline \square x = \square \end{array}$$

$$x = \frac{\square}{\square} \quad x = \square$$

Place $x = 3$ in equation (I).

$$5x \square + 3y = 9$$

$$3y = 9 - \square$$

$$3y = \square$$

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

$$y = \square$$

\therefore Solution is $(x, y) = (\square, \square)$

- 6) Solve the following simultaneous equations.
 $X + 7y = 10$; $3x - 2y = 7$
- 7) Find the value of the following determinant.

$$\begin{vmatrix} 2\sqrt{3} & 9 \\ 2 & 3\sqrt{3} \end{vmatrix}$$

Q.5 Complete the following Activities (ANY THREE)

6

1) Solve : $3x + 2y = 29$; $5x - y = 18$

$$3x + 2y = 29 \dots (I) \text{ and } 5x - y = 18 \dots (II)$$

Let's solve the equations by eliminating 'y'. Fill suitably the boxes below

Multiplying equation (II) by 2.

$$\therefore 5x \times \boxed{} - y \times \boxed{} = 18 \times \boxed{}$$

$$\therefore 10x - 2y = \boxed{} \dots (III)$$

Let's add equations (I) and (III)

$$\begin{array}{r} 3x + 2y = 29 \\ + \boxed{} - \boxed{} = \boxed{} \\ \hline \boxed{} = \boxed{} \end{array} \quad \therefore x = \boxed{}$$

Substituting $x = 5$ in equation (I)

$$3x + 2y = 29$$

$$\therefore 3 \times \boxed{} + 2y = 29$$

$$\therefore \boxed{} + 2y = 29$$

$$\therefore 2y = 29 - \boxed{}$$

$$\therefore 2y = \boxed{} \quad \therefore y = \boxed{}$$

$(x, y) = (\boxed{}, \boxed{})$ is the solution.

2) Solve the following simultaneous equations.

$$3a + 5b = 26; a + 5b = 22$$

Here the equations are

$$3a + 5b = 26 \dots (I)$$

$$a + 5b = 22 \dots (II)$$

As the sign of '5b' in both the equations is same, proceed as subtracting equation (I) and (II)

$$\begin{array}{r} 3a + 5b = 26 \\ a + 5b = 22 \\ - \quad - \quad = - \\ \hline \boxed{} = \boxed{} \end{array}$$

$$a = \frac{4}{2}$$

$$a = \boxed{}$$

Place $a = 2$ in equation (I) and obtain the value of 'b'

$$3 \times 2 + 5b = \boxed{}$$

$$6 + 5b = 26$$

$$5b = \boxed{} - 6$$

$$5b = 20$$

$$\boxed{}$$

$$b = \frac{4}{5}$$

$$b = \boxed{}$$

\therefore Solution is $(a, b) = (2, 4)$

3) Solve the following simultaneous equation using Cramer's rule.

$$3x - 4y - 10; 4x + 3y = 5$$

Given equations are

$$3x - 4y = 10$$

$$4x + 3y = 5$$

$$\begin{aligned} D &= \begin{vmatrix} 3 & -4 \\ 4 & 3 \end{vmatrix} \\ &= 3(3) - \square \\ &= 9 + 16 \\ &= 25 \end{aligned}$$

$$\begin{aligned} D_x &= \begin{vmatrix} 10 & -4 \\ 5 & 3 \end{vmatrix} \\ &= 10(3) - 5(-4) \\ &= 30 + \square \\ &= \square \end{aligned}$$

$$\begin{aligned} D_y &= \begin{vmatrix} 3 & 10 \\ 4 & 5 \end{vmatrix} \\ &= 3(5) - 4(10) \\ &= \square - 40 \\ &= -25 \end{aligned}$$

Thus,

$$\begin{aligned} x &= \frac{D_x}{D} & y &= \frac{D_y}{D} \\ &= \frac{50}{25} & &= \frac{\square}{25} \\ &= \square & &= -1 \end{aligned}$$

Therefore, $(x, y) = (\square, -1)$ is the solution.

- 4) Solve the following simultaneous equation using Cramer's rule.

$$6x - 4y = -12; 8x - 3y = -2$$

Given equations are

$$6x - 4y = -12$$

$$8x - 3y = -2$$

$$\begin{aligned} D &= \begin{vmatrix} 6 & -4 \\ 8 & -3 \end{vmatrix} \\ &= \square - 8(-4) \\ &= -18 + 32 \\ &= 14 \end{aligned}$$

$$\begin{aligned} D_x &= \begin{vmatrix} -12 & -4 \\ -2 & -3 \end{vmatrix} \\ &= -12(-3) - \square(-4) \\ &= \square - 8 \\ &= 28 \end{aligned}$$

$$\begin{aligned} D_y &= \begin{vmatrix} 6 & -12 \\ 8 & -2 \end{vmatrix} \\ &= 6(-2) - 8(-12) \\ &= -12 + 96 \\ &= \square \end{aligned}$$

$$\begin{aligned} x &= \frac{D_x}{D} & y &= \frac{D_y}{D} \\ &= \frac{28}{14} & &= \frac{\square}{14} \\ &= \square & &= 6 \end{aligned}$$

Therefore, $(x, y) = (\square, 6)$ is the solution.

Q.6 Solve the following questions (ANY THREE)

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- 1) Solve the following simultaneous equation using Cramer's rule.

$$2x + 3y = 2; x - \frac{y}{2} = \frac{1}{2}$$

- 2) Solve:

$$\frac{4}{x} + \frac{5}{y} = 7; \frac{3}{x} + \frac{4}{y} = 5$$

- 3) Solve the following simultaneous equations graphically.

$$3x - y = 2; 2x - y = 3$$

- 4) Solve the following simultaneous equations graphically.

$$x + y = 0; 2x - y = 9$$

- 5) Two numbers differ by 3. The sum of twice the smaller number and thrice the greater number is 19. Find the numbers.