

- Q1.** In each of the following systems of equations determine whether the system has a unique solution, no solution or infinitely many solutions. In case there is a unique solution, find it.

$$2x + 3y = 7 \quad 6x + 5y = 11$$

- Q2.** In each of the following systems of equations determine whether the system has a unique solution, no solution or infinitely many solutions. In case there is a unique solution, find it.

$$6x + 5y = 11 \quad 9x + \frac{15}{2}y = 21$$

- Q3.** In each of the following systems of equations determine whether the system has a unique solution, no solution or infinitely many solutions. In case there is a unique solution, find it.

$$-3x + 4y = 5 \quad \frac{9}{2}x - 6y + \frac{15}{2} = 0$$

- Q4.** For each of the following systems of equations determine the value of  $k$  for which the given system of equations has a unique solution:

$$2x + 3y = 7 \quad 6x + 5y = 11$$

- Q5.** For each of the following systems of equations determine the value of  $k$  for which the given system of equations has a unique solution:

$$2x - 3y = 1 \quad kx + 5y = 7$$

- Q6.** For each of the following systems of equations determine the value of  $k$  for which the given system of equations has a unique solution:

$$2x + ky = 1 \quad 5x - 7y = 5$$

- Q7.** For each of the following systems of equations determine the value of  $k$  for which the given system of equations has a unique solution:

$$2x + 3y - 5 = 0 \quad kx - 6y - 8 = 0$$

- Q8.** For each of the following systems of equations determine the value of  $k$  for which the given system of equations has infinitely many solutions:

$$5x + 2y = k \quad 10x + 4y = 3$$

- Q9.** For each of the following systems of equations determine the value of  $k$  for which the given system of equations has no solution:

$$3x - 4y + 7 = 0 \quad kx + 3y - 5 = 0$$

- Q10.** Find the value of  $k$  for which the following system of equations has a unique solution:

$$x + 2y = 3 \quad 5x + ky + 7 = 0$$

- Q11.** Find the value of  $k$  for which the following system of equations has a unique solution:

$$4x - 5y = k \quad 2x - 3y = 12$$

- Q12.** For what value of  $k$  will the equations  $x + 2y + 7 = 0$ ,  $2x + ky + 14 = 0$  represent coincident lines?

- Q13.** For each of the following systems of equations determine the value of  $k$  for which the given system of equations has no solution:

$$2x + ky + 3 = 0 \quad 3x + 2y - 1 = 0$$

**Q14.** Find the value of  $k$  for which the following system of equations has no solution:

$$3x - 4y + 7 = 0 \qquad kx + 3y - 5 = 0$$

**Q15.** Find the value of  $k$  for which the following system of equations has no solution:

$$2x - ky + 3 = 0 \qquad 3x + 2y - 1 = 0$$

**Q16.** For what value of  $k$ , the following system of equations will represent the coincident lines?

$$x + 2y + 7 = 0 \qquad 2x + ky + 14 = 0$$

**Q17.** Write the value of  $k$  for which the system of equations  $x + y - 4 = 9$  and  $2x + ky - 3 = 0$  has no solution.

**Q18.** Write the value of  $k$  for which the system of equations  $2x - y = 5$  and  $6x + ky = 15$  has infinitely many solution.

**Q19.** Write the number of solutions of the following pair of linear equations:

$$x + 3y - 4 = 0 \\ 2x + 6y = 7$$

**Q20.** The value of  $k$  for which the system of equations  $kx - y = 2$  and  $6x - 2y = 3$  has a unique solution, is

- (a) = 3                      (b)  $\neq 3$                       (c)  $\neq 0$                       (d) = 0

**Q21.** The value of  $k$  for which the system of equations  $2x + 3y = 5$  and  $4x + ky = 10$  has infinite number of solutions, is

- (a) 1                      (b) 3                      (c) 6                      (d) 0

**Q22.** The value of  $k$  for which the system of equations  $x + 2y - 3 = 0$  and  $5x + ky + 7 = 0$  has no solution, is

- (a) 10                      (b) 6                      (c) 3                      (d) 1

**Q23.** The value of  $k$  for which the system of equations  $3x + 5y = 0$  and  $kx + 10y = 0$  has a non-zero solution, is

- (a) 0                      (b) 2                      (c) 6                      (d) 8

**Q24.** If the system of equations  $2x + 3y = 7$  and  $(a + b)x + (2a - b)y = 21$  has infinitely many solutions, then

- (a)  $a = 1, b = 5$                       (b)  $a = 5, b = 1$                       (c)  $a = -1, b = 5$                       (d)  $a = 5, b = -1$

**Q25.** If the system of equations  $3x + y = 1$  and  $(2k - 1)x + (k - 1)y = 2k + 1$  is inconsistent, then  $k =$

- (a) 1                      (b) 0                      (c) -1                      (d) 2

**Q26.** The area of the triangle formed by the line  $\frac{x}{a} + \frac{y}{b} = 1$  with the coordinate axes is

- (a)  $ab$                       (b)  $2ab$                       (c)  $\frac{1}{2}ab$                       (d)  $\frac{1}{4}ab$

**Q27.** If a pair of linear equations in two variables is consistent, then the lines represented by two equations are:

- (a) intersecting                      (b) parallel  
(c) always coincident                      (d) intersecting or coincident

**Q28.** If  $2x - 3y = 7$  and  $(a + b)x - (a + b - 3)y = 4a + b$  represent coincident lines, then  $a$  and  $b$  satisfy the equation

- (a)  $a + 5b = 0$                       (b)  $5a + b = 0$                       (c)  $a - 5b = 0$                       (d)  $5a - b = 0$

**Q29.** If the system of equations  $2x + 3y = 7$  and  $2ax + (a + b)y = 28$  has infinitely many solutions, then

- (a)  $a = 2b$                       (b)  $b = 2a$                       (c)  $a + 2b = 0$                       (d)  $2a + b = 0$

**Q30.** The area of the triangle formed by the lines  $y = x$ ,  $x = 6$  and  $y = 0$  is

- (a) 36 sq. units      (b) 18 sq. units      (c) 9 sq. units      (d) 72 sq. units

**Q31.** If the system of equations  $kx - 5y = 2$ ,  $6x + 2y = 7$  has no solution, then  $k =$

- (a) -10      (b) -5      (c) -6      (d) -15

**Q32.** The area of the triangle formed by the lines  $x = 3$ ,  $y = 4$  and  $x = y$  is

- (a)  $\frac{1}{2}$  sq. unit      (b) 1 sq. unit      (c) 2 sq. unit      (d) None of these

**Q33.** Solve the following systems of equations by using the method of substitution:

$$3x - 5y = -1 \quad x - y = -1$$

**Q34.** Solve the following systems of equations by using the method of substitution:

$$x + 2y = -1 \quad 2x - 3y = 12$$

**Q35.** Gloria is walking along the path joining  $(-2, 3)$  and  $(2, -2)$ , while Suresh is walking along the path joining  $(0, 5)$  and  $(4, 0)$ . Represent this situation graphically.

**Q36.** Solve the following systems of equations:

$$0.4x + 0.3y = 1.7 \quad 0.7x - 0.2y = 0.8$$

**Q37.** Solve:

$$3(2u + v) = 7uv \quad 3(u + 3v) = 11uv$$

**Q38.** Solve the following systems of linear equations by using the method of elimination by equating the coefficients:

$$\frac{x}{10} + \frac{y}{5} + 1 = 15 \quad \frac{x}{8} + \frac{y}{6} = 15$$

**Q39.** Solve the following systems of linear equations by using the method of elimination by equating the coefficients:

$$8x + 5y = 9 \quad 3x + 2y = 4$$

**Q40.** Solve the following systems of linear equations by using the method of elimination by equating the coefficients:

$$3x + 2y = 11 \quad 2x + 3y = 4$$

**Q41.** Solve the following systems of equations by using the method of substitution:

$$\frac{2x}{a} + \frac{y}{b} = 2 \quad \frac{x}{a} - \frac{y}{b} = 4$$

**Q42.** Solve the following systems of equations by using the method of substitution:

$$2x + 3y = 9 \quad 3x + 4y = 5$$

**Q43.** Solve the following systems of equations:

$$3x - \frac{y+7}{11} + 2 = 10 \quad 2y + \frac{x+11}{7} = 10$$

**Q44.** Solve the following systems of equations:

$$x + \frac{y}{2} = 4 \quad \frac{x}{3} + 2y = 5$$

**Q45.** Solve the following systems of equations:

$$\frac{x}{3} + \frac{y}{4} = 11 \quad \frac{5x}{6} - \frac{y}{3} = -7$$

**Q46.** Solve the following systems of equations:

$$\frac{x}{7} + \frac{y}{3} = 5 \quad \frac{x}{2} - \frac{y}{9} = 6$$

**Q47.** Solve the following systems of equations:

$$\frac{x}{2} + y = 0.8 \quad \frac{7}{x + \frac{y}{2}} = 10$$

**Q48.** Solve the following systems of equations:

$$0.5x + 0.7y = 0.74 \quad 0.3x + 0.5y = 0.5$$

**Q49.** Solve the following systems of equations:

$$2x - \frac{3}{y} = 9 \quad 3x + \frac{7}{y} = 2 \quad y \neq 0$$

**Q50.** Solve the each of the following systems of equations by using the method of cross-multiplication:

$$x + y = 7 \quad 5x + 12y = 7$$

**Q51.** Solve the each of the following systems of equations by using the method of cross-multiplication:

$$2x + 3y = 17 \quad 3x - 2y = 6$$

**Q52.** Solve the each of the following systems of equations by using the method of cross-multiplication:

$$2x - y - 3 = 0 \quad 4x + 3y - 3 = 0$$

**Q53.** Obtain the condition for the following system of linear equations to have a unique solution

$$ax + by = c \quad lx + my = n$$

**Q54.** For what value of  $k$ , will the following system of equations have infinitely many solutions?

$$2x + 3y = 4 \quad (k + 2)x + 6y = 3k + 2$$

**Q55.** Find the value(s) of  $k$  for which the system of equations

$$kx - y = 2 \quad 6x - 2y = 3$$

has (i) a unique solution (ii) no solution.

Is there a value of  $k$  for which the system has infinitely many solutions?

**Q56.** For each of the following systems of equations determine the value of  $k$  for which the given system of equations has infinitely many solution:

$$(k - 3)x + 3y = k \quad kx + ky = 12$$

**Q57.** Solve the each of the following systems of equations by using the method of cross-multiplication:

$$2x + y - 35 = 0 \quad 3x + 4y - 65 = 0$$

**Q58.** For what value of  $k$ , the following pair of linear equations has infinitely many solutions?

$$10x + 5y - (k - 5) = 0$$

$$20x + 10y - k = 0$$

**Q59.** 4 chairs and 3 tables cost Rs. 2100 and 5 chairs and 2 table cost Rs. 1750. Find the cost of a chair and a table separately.

**Q60.** 37 pens and 53 pencils together cost Rs. 320, while 53 pens and 37 pencils together cost Rs. 400. Find the cost of a pen and that of a pencil.

- Q61.** 2 tables and 3 chairs together cost Rs. 2000 whereas 3 tables and 2 chairs together cost Rs. 25000. Find the total cost of 1 table and 5 chairs.
- Q62.** 3 bags and 4 pens together cost Rs. 257 whereas 4 bags and 3 pens together cost Rs. 324. Find the total cost of 1 bag and 10 pens.

**Q63.** Solve the following systems of equations:

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

**Q64.** Solve the following systems of equations:

$$\frac{4}{x} + 3y = 8 \quad \frac{6}{x} - 4y = -5$$

- Q65.** I am three times as old as my son. Five years later, I shall be two and a half times as old as my son. How old am I and how old is my son?
- Q66.** The difference between two numbers is 26 and one number is three times the other. Find them.
- Q67.** The sum of two numbers is 8. If their sum is four times their difference, find the numbers.
- Q68.** Sum of two numbers is 35 and their difference is 13. Find the numbers.
- Q69.** Ten students of class X took part in Mathematics quiz. If the number of girls is 4 more than the number of boys. Represent this situation algebraically and graphically.

**Q70.** Show graphically that the system of equations  $2x + 4y = 10$ ,  $3x + 6y = 12$  has no solution.

**Q71.** Show graphically that the system of equations  $3x - y = 2$ ,  $9x - 3y = 6$  has infinitely many solution.

**Q72.** Use a single graph paper and draw the graph of following equations:

$$2y - x = 8; \quad 5y - x = 14, \quad y - 2x = 1$$

Obtain the vertices of the triangle so obtained.

**Q73.** Draw the graphs of the following equations:

$$\begin{aligned} 2x - y - 2 &= 0 \\ 4x + 3y - 24 &= 0 \\ y + 4 &= 0 \end{aligned}$$

Obtain the vertices of the triangle so obtained. Also, determine its area.

**Q74.** Show graphically that each one of the following systems of equations is inconsistent (*i.e.*, has no solutions):

$$2y - x = 9 \quad \text{and} \quad 6y - 3x = 21$$

**Q75.** Show graphically that each one of the following systems of equations has infinitely many solutions:

$$x - 2y + 11 = 0 \quad \text{and} \quad 3x - 6y + 33 = 0$$

**Q76.** Solve the following systems of equations graphically:

$$2x + y - 3 = 0 \quad \text{and} \quad 2x - 3y + 7 = 0$$

**Q77.** Solve the following systems of equations graphically:

$$3x + y + 1 = 0 \quad \text{and} \quad 2x - 3y + 8 = 0$$

**Q78.** Determine graphically the vertices of a trapezium, the equations of whose sides are:  $x = 0$ ,  $y = 0$ ,  $y = 4$  and  $2x + y = 6$ . Also, determine its area.

**Q79.** Draw the graphs of the following equations:

$$2x - 3y + 6 = 0, \quad 2x + 3y - 18 = 0 \quad \text{and} \quad y - 2 = 0$$

Find the vertices of the triangle so obtained. Also, find the area of the triangle.

**Q80.** Determine, graphically whether the system of equations  $x - 2y = 2$ ,  $4x - 2y = 5$  is consistent or in-consistent.

**Q81.** Determine graphically the vertices of the triangle, the equations of whose sides are given below:

(i)  $2y - x = 8$ ,  $5y - x = 14$  and  $y - 2x = 1$       (ii)  $y = x$ ,  $y = 0$  and  $3x + 3y = 10$

**Q82.** Solve the following system of equations graphically:

$$2x - 3y + 6 = 0 \quad \text{and} \quad 2x + 3y - 18 = 0$$

Also, find the area of the region bounded by these two lines and  $y$ -axis.

**Q83.** Solve the following system of equations:

$$\frac{1}{2x} - \frac{1}{y} = -1 \qquad \frac{1}{x} + \frac{1}{2y} = 8, \quad \text{where } x \neq 0, y \neq 0$$

**Q84.** Solve:  $\frac{2}{x} + \frac{2}{3y} = \frac{1}{6}$        $\frac{3}{x} + \frac{2}{y} = 0$

and hence find 'a' for which  $y = ax - 4$ .

**Q85.** Solve:  $2x - y = 4$        $y - z = 6$        $x - z = 10$

**Q86.** Solve:  $217x + 131y = 913$        $131x + 217y = 827$

**Q87.** Solve:  $\frac{5}{x+y} - \frac{2}{x-y} = -1$        $\frac{15}{x+y} + \frac{7}{x-y} = 10$

where  $x + y \neq 0$  and  $x - y \neq 0$ .

**Q88.** Solve:  $4x + \frac{6}{y} = 15$        $6x - \frac{8}{y} = 14$

and hence find 'p' if  $y = px - 2$ .

**Q89.** Solve the following systems of equations:

$$\frac{1}{2x} + \frac{1}{3y} = 2 \qquad \frac{1}{3x} + \frac{1}{2y} = \frac{13}{6}$$

**Q90.** Solve the following systems of equations:

$$\frac{1}{7x} + \frac{1}{6y} = 3 \qquad \frac{1}{2x} - \frac{1}{3y} = 5$$

**Q91.** Solve:  $x + 2y + z = 7$        $x + 3z = 11$        $2x - 3y = 1$

**Q92.** Solve the following systems of equations:

$$\frac{1}{5x} + \frac{1}{6y} = 12 \qquad \frac{1}{3x} - \frac{3}{7y} = 8 \quad x \neq 0, y \neq 0$$

**Q93.** Solve the following systems of equations:

$$\frac{xy}{x+y} = \frac{6}{5} \qquad \frac{xy}{y-x} = 6, \quad \text{where } x + y \neq 0, y - x \neq 0$$

**Q94.** Solve the following systems of equations:

$$\frac{2}{x} + \frac{3}{y} = \frac{9}{xy} \qquad \frac{4}{x} + \frac{9}{y} = \frac{21}{xy}, \quad \text{where } x \neq 0, y \neq 0$$

**Q95.** Solve the following systems of equations:

$$\frac{3}{x+y} + \frac{2}{x-y} = 2 \quad \frac{9}{x+y} - \frac{4}{x-y} = 1$$

**Q96.** Solve the following systems of equations:

$$23x - 29y = 98 \quad 29x - 23y = 110$$

**Q97.** Solve the following systems of equations:

$$99x + 101y = 499 \quad 101x + 99y = 501$$

**Q98.** Solve the following systems of equations:

$$x + y = 5xy \quad 3x + 2y = 13xy, \quad x \neq 0, y \neq 0$$

**Q99.** Solve the following systems of equations:

$$\frac{5}{x+1} - \frac{2}{y-1} = \frac{1}{2} \quad \frac{10}{x+1} + \frac{2}{y-1} = \frac{5}{2}, \quad \text{where } x \neq -1, y \neq 1$$

**Q100** Solve each of the following systems of equations by the method of cross-multiplication:

$$ax + by = a - b \quad bx - ay = a + b.$$

**Q101** Solve the following system of equations:

$$x + y = a - b \quad ax - by = a^2 + b^2.$$

**Q102** Solve each of the following systems of equations by the method of cross-multiplication:

$$6(ax + by) = 3a + 2b \quad 6(bx - ay) = 3b - 2a$$

**Q103** Solve each of the following systems of equations by the method of cross-multiplication:

$$2(ax - by) + a + 4b = 0 \quad 2(bx + ay) + b - 4a = 0$$

**Q104** Solve :

$$x + y = a + b \quad ax - by = a^2 - b^2.$$

**Q105** Solve each of the following systems of equations by the method of cross-multiplication:

$$5ax + 6by = 28 \quad 3bx + 4by = 18.$$

**Q106** Solve each of the following systems of equations by the method of cross-multiplication:

$$ax + by = \frac{a+b}{2} \quad 3x - 5y = 4.$$

**Q107** Solve each of the following systems of equations by the method of cross-multiplication:

$$\frac{x}{a} + \frac{y}{b} = a + b \quad \frac{x}{a^2} + \frac{y}{b^2} = 2.$$

**Q108** Solve each of the following systems of equations by the method of cross-multiplication:

$$\frac{x}{a} + \frac{y}{b} = 2 \quad ax - by = a^2 - b^2.$$

**Q109** A man has only 20 paise coins and 25 paise coins in his purse. If he has 50 coins in all totaling Rs. 11.25, how many coins of each kind does he have?

**Q110** A and B each have certain number of oranges. A says to B, "if you give me 10 of your oranges, I will have twice the number of oranges left with you". B replies, "if you give me 10 of your oranges, I will have the same number of oranges as left with you". Find the number of oranges with A and B separately.

**Q111** Write the set of values of  $a$  and  $b$  for which the following system of equations has infinitely many solutions.

$$\begin{aligned}2x + y &= 7 \\ 2ax + (a + b)y &= 28.\end{aligned}$$

**Q112** Prove that there is a value of  $c$  ( $\neq 0$ ) for which the system

$$\begin{aligned}6x + 3y &= c - 3 \\ 12x + cy &= c\end{aligned}$$

has infinitely many solutions. Find this value.

**Q113** Find the value of  $k$  for which each of the following systems of equations have infinitely many solutions:

$$2x - 3y = 7 \quad (k + 2)x - (2k + 1)y = 2(k - 1)$$

**Q114** Determine the values of  $m$  and  $n$  so that the following system of linear equations have infinite number of solutions:

$$\begin{aligned}(2m - 1)x + 3y - 5 &= 0 \\ 3x + (n - 1)y - 2 &= 0\end{aligned}$$

**Q115** Determine the values of  $a$  and  $b$  for which the following system of linear equations has infinite solutions:

$$\begin{aligned}2x - (a - 4)y &= 2b + 1 \\ 4x - (a - 1)y &= 5b - 1\end{aligned}$$

**Q116** Seven times a two digit number is equal to four times the number obtained by reversing the digits. If the difference between the digits is 3. Find the number.

**Q117** A number consists of two digits whose sum is five. When the digits are reversed, the number becomes greater by nine. Find the number.

**Q118** The sum of digits of a two digit number is 13. If the number is subtracted from the one obtained by interchanging the digits, the result is 45. What is the number?

**Q119** A two digit number is obtained by either multiplying sum of the digits by 8 and adding 1 or by multiplying the difference of the digits by 13 and adding 2. Find the number.

**Q120** 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.

**Q121** In a two digit number, the ten's digit is three times the unit's digit. When the number is decreased by 54, the digits are reversed. Find the number.

**Q122** In a two digit number, the unit's digit is twice the ten's digit. If 27 is added to the number, the digits interchange their places. Find the number.

**Q123** On selling a T.V. at 5% gain and a fridge at 10% gain, a shopkeeper gains Rs. 2000. But if he sells the T.V. at 10% gain and the fridge at 5% loss. He gains Rs. 1500 on the transaction. Find the actual prices of T.V. and fridge.

**Q124** Reena has pens and pencils which together are 40 in number. If she has 5 more pencils and 5 less pens, then number of pencils would become 4 times the number of pens. Find the original number of pens and pencils.

**Q125** A and B each have a certain number of mangoes. A says to B, "if you give 30 of your mangoes, I will have twice as many as left with you". B replies, "if you give me 10, I will have thrice as many as left with you.". How many mangoes does each have?



- Q126** A fraction becomes  $\frac{3}{5}$ , if 1 is added to both numerator and denominator. If, however, 5 is subtracted from both numerator and denominator, the fraction becomes 1.2, What is the fraction?
- Q127** A fraction is such that if the numerator is multiplied by 3 and denominator is reduced by 3, we get  $\frac{18}{11}$ , but if the numerator is increased by 8 and denominator is doubled, we get 2.5. Find the fraction.
- Q128** The numerator of a fraction is 4 less than the denominator. if the numerator is decreased by 2 and denominator is increased by 1, then the denominator is eight times the numerator. Find the fraction.
- Q129** A fraction becomes  $\frac{1}{3}$  if 1 is subtracted from both its numerator and denominator. If 1 is added to both the numerator and denominator, it becomes 1.2. Find the fraction.
- Q130** The sum of a numerator and denominator of a fraction is 18. If the denominator is increased by 2, the fraction reduces to  $\frac{1}{3}$ . Find the fraction
- Q131** When 3 is added to the denominator and 2 is subtracted from the numerator a fraction becomes  $\frac{1}{4}$ . And, when 6 is added to numerator and the denominator is multiplied by 3, it becomes  $\frac{2}{3}$ . Find the fraction.
- Q132** If the numerator of a fraction is multiplied by 2 and the denominator is reduced by 5 the fraction becomes  $\frac{6}{5}$ . And, if the denominator is doubled and the numerator is increased by 8, the fraction becomes  $\frac{2}{5}$ . Find the fraction.
- Q133** If 2 is added to the numerator of a fraction, it reduces to  $\frac{1}{2}$  and if 1 is subtracted from the denominator, it reduces to  $\frac{1}{3}$ . Find the fraction.
- Q134** If twice the son's age in years is added to the father's age, the sum is 70. But if twice the father's age is added to the son's age, the sum is 95. Find the ages of father and son.
- Q135** Ten years later, A will be twice as old as B and five years ago, A was three times as old as B. What are the present ages of A and B.
- Q136** A father is three times as old as his son. After twelve years, his age will be twice as that of his son then. Find their present ages.
- Q137** Ten years ago, father was twelve times as old as his son and ten years hence, he will be twice as old as his son will be. Find their present ages.
- Q138** A father is three times as old as his son. In 12 years time, he will be twice as old as his son. Find the present ages of father and the son.
- Q139** The present age of a father is three years more than three times the age of the son. Three years hence father's age will be 10 years more than twice the age of the son. Determine their present ages.
- Q140** Ten years ago, a father was twelve times as old as his son and ten years hence, he will be twice as old as his son will be then. Find their present ages.
- Q141** Six years hence a man's age will be three times the age of his son and three years ago he was nine times as old as his son. Find their present ages.
- Q142** The total expenditure per month of a household consists of a fixed rent of the house and mess charges depending upon the number of people sharing the house. The total monthly expenditure is Rs. 3900 for 2 people and Rs. 7500 for 5 people. Find the rent of the house and the mess charges per head per month.
- Q143** A sailor goes 8 km downstream in 40 minutes and returns in 1 hour. Determine the speed of the sailor in still water and the speed of the current.
- Q144** There are two examination rooms A and B. If 10 candidates are sent from A to B, the number of students in each room is same. If 20 candidates are sent from B to A, the number of students in A is double the number of students in B. Find the number of students in each room.

**Q145** A and B each has some money. If A gives Rs. 30 to B, then B will have twice the money left with A. But, if B gives Rs. 10 to A, then A will have thrice as much as is left with B. How much money does each have?

**Q146** The incomes of X and Y are in the ratio of 8 : 7 and their expenditures are in the ratio 19 : 16. If each saves Rs. 1250, find their incomes.

**Q147** The ratio of incomes of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them saves Rs. 200 per month, find their monthly incomes.

**Q148** A man starts his job with a certain monthly salary and earns a fixed increment every year. If his salary was Rs. 1500 after 4 years of service and Rs. 1800 after 10 years of service, what was his starting salary and what is the annual increment?

**Q149** Solve the following system of equations graphically  $x + 3y = 6$ ,  $2x - 3y = 12$  and hence find the value of  $a$ , if  $4x + 3y = a$ .

**Q150** In a  $\triangle ABC$ ,  $\angle A = x^\circ$ ,  $\angle B = 3x^\circ$  and  $\angle C = y^\circ$ . If  $3y - 5x = 30$ , prove that the triangle is right angled.

**Q151** In a  $\triangle ABC$ ,  $\angle A = x^\circ$ ,  $\angle B = (3x - 2)^\circ$ ,  $\angle C = y^\circ$ . Also,  $\angle C - \angle B = 9^\circ$ . Find the three angles.

**Q152** 2 men and 7 boys can do a piece of work in 4 days. The same work is done in 3 days by 4 men and 4 boys. How long would it take one man and one boy to do it?

**Q153** Solve the following system of linear equations graphically:

$$2x - y - 4 = 0$$

$$x + y + 1 = 0$$

Find the points where the lines meet y-axis.

**Q154** Solve the following system of linear equations graphically:

$$x - y = 1$$

$$2x + y = 8$$

Shade the area bounded by these two lines and y-axis. Also, determine this area.

**Q155** Draw a graph of  $2x + y = 6$  and  $2x - y + 2 = 0$ . Shade the region bounded by these lines and x-axis. Find the area of the shaded region.

**Q156** Solve graphically each of the following systems of linear equations. Also find the coordinates of the points where the lines meet axis of  $y$ .

$$2x - 5y + 4 = 0$$

$$2x + y - 8 = 0$$

**Q157** Solve graphically each of the following systems of linear equations. Also find the coordinates of the points where the lines meet axis of  $y$ .

$$x + 2y - 7 = 0$$

$$2x - y - 4 = 0$$

**Q158** Solve graphically each of the following systems of linear equations. Also find the coordinates of the points where the lines meet axis of  $y$ .

$$2x - y - 11 = 0$$

$$x - y - 1 = 0$$

**Q159** Solve graphically each of the following systems of linear equations. Also find the coordinates of the points where the lines meet axis of  $y$ .

$$3x - 2y = 12$$

$$5x - 2y = 4$$

**Q160** Solve the following system of linear equations graphically and shade the region between the two lines and x-axis:

$$3x + 2y - 4 = 0$$

$$2x - 3y - 7 = 9$$

**Q161** Determine graphically the coordinates of the vertices of a triangle, the equations of whose sides are:

$$y = x, \quad 3y = x, \quad x + y = 86$$

**Q162** Determine graphically the coordinates of the vertices of a triangle, the equations of whose sides are:

$$y = x, \quad y = 2x \quad \text{and} \quad y + x = 6$$

**Q163** Solve the following system of linear equations graphically:

$$4x - 5y - 20 = 0 \quad 3x + 5y - 15 = 0$$

Determine the vertices of the triangle formed by the lines representing the above equation and the  $y$ -axis.

**Q164** Solve graphically the system of linear equations:

$$4x - 3y + 4 = 0 \quad 4x + 3y - 20 = 0$$

Find the area bounded by these lines and  $x$ -axis.

**Q165** Solve the following system of linear equations graphically:

$$3x + y - 11 = 0 \quad x - y - 1 = 0.$$

Shade the region bounded by these lines and  $y$ -axis. Also, find the area of the region bounded by these lines and  $y$ -axis.

**Q166** Solve the following systems of equations:

$$\frac{44}{x+y} + \frac{30}{x-y} = 10 \quad \frac{55}{x+y} + \frac{40}{x-y} = 13$$

**Q167** Represent the following pair of equations graphically and write the coordinates of points where the lines intersect  $y$ -axis

$$x + 3y = 6 \quad 2x - 3y = 12$$

**Q168** For what value of  $k$  will the following system of linear equations has no solution?

$$3x + y = 1 \quad (2k - 1)x + (k - 1)y = 2k + 1.$$

**Q169** Solve each of the following systems of equations by the method of cross-multiplication:

$$\frac{ax}{b} - \frac{by}{a} = a + b \quad ax - by = 2ab.$$

**Q170** Solve each of the following systems of equations by the method of cross-multiplication:

$$mx - ny = m^2 + n^2 \quad x + y = 2m.$$

**Q171** Solve :

$$\frac{x}{a} + \frac{y}{b} = 2 \quad ax - by = a^2 - b^2.$$

**Q172** Find the value of  $k$  for which each of the following systems of equations have infinitely many solution:

$$kx + 3y = 2k + 1 \quad 2(k + 1)x + 9y = 7k + 1.$$

**Q173** Find the value of  $k$  for which each of the following systems of equations have infinitely many solution:

$$x + (k + 1)y = 4 \quad (k + 1)x + 9y = 5k + 2.$$

**Q174** Find the value of  $k$  for which each of the following systems of equations have infinitely many solution:

$$2x + 3y = 2 \quad (k + 2)x + (k + 1)y = 2(k - 1)$$

**Q175** Determine the value of  $k$  so that the following linear equations have no solution:

$$(3k + 1)x + 2y - 2 = 0 \quad (k^2 + 1)x + (k - 2)y - 5 = 0$$

**Q176** Find the values of  $\alpha$  and  $\beta$  for which the following system of linear equations has infinite number of solutions:

$$2x + 3y = 7 \quad 2\alpha x + (\alpha + \beta)y = 28.$$

**Q177** Find the values of  $p$  and  $q$  for which the following system of equations has infinite number of solutions:

$$2x + 3y = 7 \quad (p + q)x + (2p - q)y = 21.$$

**Q178** Find the value of  $k$  for which the following system of linear equations has infinite solutions:

$$x + (k + 1)y = 5 \quad (k + 1)x + 9y = 8k - 1.$$

**Q179** Determine the values of  $a$  and  $b$  so that the following system of linear equations have infinitely many solutions:

$$(2a - 1)x + 3y - 5 = 0 \quad 3x + (b - 1)y - 2 = 0$$

**Q180** For what value of  $\alpha$ , the system of equations

$$\alpha x + 2y = \alpha - 3 \quad 12x + \alpha y = \alpha.$$

will have no solution?

**Q181** Find the value of  $k$  for which each of the following systems of equations have infinitely many solution:

$$2x + 3y = k \quad (k - 1)x + (k + 2)y = 2k.$$

**Q182** Find the value of  $k$  for which each of the following systems of equations have infinitely many solution:

$$2x + 3y = 7 \quad (k + 1)x + (2k - 1)y = 4k + 1.$$

**Q183** Find the value of  $k$  for which each of the following systems of equations have infinitely many solution:

$$2x + (k - 2)y = k \quad 6x + (2k - 1)y = 2k + 5.$$

**Q184** Find the values of  $a$  and  $b$  for which the following system of equations has infinitely many solutions:

$$(a - 1)x + 3y = 2 \quad 6x + (1 - 2b)y = 6.$$

**Q185** Find the values of  $a$  and  $b$  for which the following system of equations has infinitely many solutions:

$$2x - (2a + 5)y = 5 \quad (2b + 1)x - 9y = 15.$$

**Q186** A two digits number is 4 times the sum of its digits. If 18 is added to the number, the digits are reversed. Find the number.

**Q187** The sum of a two digit number and the number obtained by reversing the order of its digits is 99. If the digits differ by 3, find the number.

**Q188** The sum of digits of a two digit number is 15. The number obtained by reversing the order of digits of the given number exceeds the given number by 9. Find the given number.

**Q189** The sum of a two digit number and the number formed by interchanging the digit is 132. If 12 is added to the number, the new number becomes 5 times the sum of the digits. Find the number.

**Q190** The sum of a two digit number and the number formed by interchanging its digits is 110. If 10 is subtracted from the first number, the new number is 4 more than 5 times the sum of the digits in the first number. Find the first number.

**Q191** Find the values of  $a$  and  $b$  for which the following system of equations has infinitely many solutions:

$$2x + 3y - 7 = 0 \quad (a - 1)x + (a + 1)y = (3a - 1).$$

**Q192** Find the values of  $a$  and  $b$  for which the following system of equations has infinitely many solutions:

$$3x + 4y = 12 \quad (a + b)x + 2(a - b)y = 5a - 1.$$

**Q193** A two digit number is such that the product of its digits is 20. If 19 is added to the number, the digits interchange their places. Find the number.

- Q194.** A two digit number is 4 times the sum of its digits and twice the product of the digits. Find the number.
- Q195.** A two digit number is 3 more than  $r$  times the sum of its digits. If 18 is added to the number, the digits are reversed. Find the number.
- Q196.** A two digit number is 4 more than 6 times of its digits. If 18 is subtracted from the number, the digits are reversed. Find the number.
- Q197.** The sum of the numerator and denominator of a fraction is 3 less than twice the denominator. If the numerator and denominator are decreased by 1, the numerator becomes half the denominator. Determine the fraction.
- Q198.** The sum of the numerator and denominator of a fraction is 4 more than twice the numerator. If the numerator and denominator are increased by 3, they are in the ratio 2 : 3. Determine the fraction.
- Q199.** The denominator of a fraction is 4 more than twice the numerator. When both the numerator and denominator are decreased by 6, then the denominator becomes 12 times the numerator. Determine the fraction.
- Q200.** Two years ago, a father was five times as old as his son. Two years later, his age will be 8 more than three times the age of the son. Find the present ages of father and son.
- Q201.** Father's age is three times the sum of ages of his two children. After 5 years his age will be twice the sum of ages of two children. Find the age of father.
- Q202.** The sum of the numerator and denominator of a fraction is 12. If the denominator is increased by 3, the fraction becomes  $\frac{1}{2}$ . Find the fraction.

**Q203** Solve the following systems of equations:

$$\frac{6}{x+y} = \frac{7}{x-y} + 3$$

$$\frac{1}{2(x+y)} = \frac{1}{3(x-y)} \quad \text{where } x+y \neq 0 \text{ and } x-y \neq 0.$$

**Q204** Solve:  $\frac{1}{2(2x+3y)} + \frac{12}{7(3x-2y)} = \frac{1}{2}$

$$\frac{7}{2x+3y} + \frac{4}{3x-2y} = 2 \quad \text{where } 2x+3y \neq 0 \text{ and } 3x-2y \neq 0.$$

**Q205** Draw the graphs of the following equations on the same graph paper.

$$2x + y = 2; \quad 2x + y = 6$$

Find the coordinates of vertices of the trapezium formed by these lines. Also, find the area of the trapezium so formed.

**Q206** Solve the following systems of equations:

$$\frac{22}{x+y} + \frac{15}{x-y} = 5 \quad \frac{55}{x+y} + \frac{45}{x-y} = 14$$

**Q207** If three times the larger of the two numbers is divided by the smaller one, we get 4 as quotient and 3 as remainder. Also, if seven times the smaller number is divided by the larger one, we get 5 as quotient and 1 as remainder. Find the numbers.

**Q208** The sum of a two digit number and the number obtained by reversing the order of its digits is 121, and the two digits differ by 3. Find the number.

**Q209** Solve the following system of equations in  $x$  and  $y$ :

$$\frac{a}{x} - \frac{b}{y} = 0 \qquad \frac{ab^2}{x} + \frac{a^2b}{y} = a^2 + b^2, \quad \text{where } x, y \neq 0.$$

**Q210** Solve :

$$\frac{x}{a} + \frac{y}{b} = a + b \qquad \frac{x}{a^2} + \frac{y}{b^2} = 2.$$

**Q211** Solve the following systems of equations:

$$x - y + z = 4 \qquad x + y + z = 2 \qquad 2x + y - 3z = 0$$

**Q212** Solve the following systems of equations:

$$x - y + z = 4 \qquad x - 2y - 2z = 9 \qquad 2x + y + 3z = 1$$

**Q213** Solve the following systems of equations:

$$\frac{2}{3x + 2y} + \frac{3}{3x - 2y} = \frac{17}{5} \qquad \frac{5}{3x + 2y} + \frac{1}{3x - 2y} = 2$$

**Q214** Solve the following systems of equations:

$$\frac{1}{2(x + 2y)} + \frac{5}{3(3x - 2y)} = \frac{-3}{2} \qquad \frac{5}{4(x + 2y)} - \frac{3}{5(3x - 2y)} = \frac{61}{60}$$

**Q215** Solve the following systems of equations:

$$\frac{5}{x + y} - \frac{2}{x - y} = -1 \qquad \frac{15}{x + y} + \frac{7}{x - y} = 10$$

**Q216** A boat goes 24 km upstream and 128 km downstream in 6 hrs. It goes 30 km upstream and 21 km downstream in  $6\frac{1}{2}$  hrs. Find the speed of the boat in still water and also speed of the stream.

**Q217** The boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours, it can go 40 km upstream and 55 km downstream. Determine the speed of stream and that of the boat in still water.

**Q218** A train covered a certain distance at a uniform speed. If the train would have been 6 km/h faster, it would have taken 4 hours less than the scheduled time. And if the train were slower by 6 km/h, it would have taken 6 hours more than the scheduled time. Find the length of the journey.

**Q219** X takes 3 hours more than Y to walk 30 km. But, if X doubles his pace, he is ahead of Y by  $1\frac{1}{2}$  hours. Find their speed of walking.

**Q220** A boat covers 32 km upstream and 36 km downstream in 7 hours. Also, it covers 40 km upstream and 48 km downstream in 9 hours. Find the speed of the boat in still water and that of the stream.

**Q221** Ved travels 600 km to his home partly by train and partly by car. He takes 8 hours if he travels 120 km by train and the rest by car. He takes 20 minutes longer if he travels 200 km by train and the rest by car. Find the speed of the train and the car.

**Q222** A is elder to B by 2 years. A's father f is twice as old as A and B is twice as old as his sister S. If the ages of the father and sister differ by 40 years. Find the age of A.

**Q223** Points A and B are 90 km apart from each other on a highway. A car starts from A and another from B at the same time. if they go in the same direction they meet in 9 hours and if they go in opposite directions they meet in  $9/7$  hours. Find their speeds.

**Q224** A and B are fiends and their ages differ by 2 years. A's father D is twice as old as A and B is twice as old as his sister C. The age of D and C differ by 40 years. Find the ages of A and B.

- Q225** A man walks a certain distance with certain speed. If he walks  $\frac{1}{2}$  km an hour faster, he takes 1 hour less. But, if he walks 1 km an hour slower, he takes 3 more hours. Find the distance covered by the man and his original rate of walking.
- Q226** While covering a distance of 30 km. Ajeet takes 2 hours more than Amit. If Ajeet doubles his speed, he would take 1 hour less than Amit. Find their speeds of walking.
- Q227** A boat goes 12 km upstream and 40 km downstream in 8 hours. It can go 16 km upstream and 32 km downstream in the same time. Find the speed of the boat in still water and the speed of the stream.
- Q228** A takes 3 hours more than B to walk a distance of 30 km. But if A doubles his pace (speed) he is ahead of B by  $1\frac{1}{2}$  hours. Find the speeds of A and B.
- Q229** On selling a tea-set at 5% loss and a lemon-set at 15% gain, a crockery seller gains Rs. 7. If he sells the tea-set 5% gain and the lemon-set at 10% gain, he gains Rs. 13. Find the actual price of the tea-set and the lemon-set.
- Q230** 8 men and 12 boys can finish a piece of work in 10 days while 6 men and 8 boys can finish it in 14 days. Find the time taken by one man alone and that by one boy alone to finish the work.
- Q231** Students of a class are made to stand in rows. If one student is extra in a row, there would be 2 rows less. If one student is less in a row there would be 3 rows more. Find the number of students in the class.
- Q232** A person invested some amount at the rate of 12% simple interest and some other amount at the rate of 10% simple interest. He received yearly interest of Rs. 130. But if he had interchanged the amounts invested, he would have received Rs. 4 more as interest. How much amount did he invest at different rates?
- Q233** The area of a rectangle remains the same if the length is increased by 7 metres and the breadth is decreased by 3 metres. The area remains unaffected if the length is decreased by 7 metres and breadth is increased by 5 metres. Find the dimensions of the rectangle.
- Q234** Find the four angles of a cyclic quadrilateral ABCD in which  $\angle A = (2x - 1)^\circ$ ,  $\angle B = (y + 5)^\circ$ ,  $\angle C = (2y + 15)^\circ$  and  $\angle D = (4x - 7)^\circ$ .
- Q235** In a rectangle, the length is increased and breadth reduced each by 2 units, the area is reduced by 28 square units. If, however the length is reduced by 1 unit and the breadth increased by 2 units, the area increases by 33 square units. Find the area of the rectangle.
- Q236** Draw the graphs of  $x - y + 1 = 0$  and  $3x + 2y - 12 = 0$ . Determine the coordinates of the vertices of the triangle formed by these lines and  $x$ -axis and shade the triangular area. Calculate the area bounded by these lines and  $x$ -axis.
- Q237** Draw the graphs of the following equations on the same graph paper:  

$$2x + 3y = 12 \qquad x - y = 1$$
Find the coordinates of the vertices of the triangle formed by the two straight lines and the  $y$ -axis.
- Q238** A wizard having powers of mystic incantations and magical medicines seeing a cock fight going on, spoke privately to both the owners of cocks. To one he said; if your bird wins, then you give me your stake-money, but if you do not win, I shall give you two thirds of that'. Going to the other, he promised in the same way to give three fourths. From both of them his gain would be only 12 gold coins. Find the stake of money each of the cock-owners have.
- Q239** A railway half ticket costs half the full fare and the reservation charge is the same on half ticket as on full ticket. One reserved first class ticket from Mumbai to Ahmedabad costs Rs. 216 and one full and one half reserved first class tickets cost Rs. 327. What is the basic first class full fare and what is the reservation charge?

**Q240** Find the values of  $p$  and  $q$  for which the following system of linear equations has infinite number of solutions:

$$2x + 3y = 9 \quad (p + q)x + (2p + q)y = 3(p + q + 1).$$

**Q241** The sum of a two digit number and the number obtained by reversing the order of its digits is 165. If the digits differ by 3, find the number.

**Q242** Find the values of  $a$  and  $b$  for which the following system of linear equations has infinite number of solutions:

$$2x - 3y = 7 \quad (a + b)x - (a + b - 3) = 4a + b.$$

**Q243** Solve each of the following systems of equations by the method of cross-multiplication:

$$\frac{b}{a}x + \frac{a}{b}y = a^2 + b^2 \quad x + y = 2ab.$$

**Q244** A part of monthly hostel charges in a college are fixed and the remaining depend on the number of days one has taken food in the mess. When a student  $A$  takes food for 20 days, he has to pay Rs. 1000 as hostel charges whereas a student  $B$ , who takes food for 26 days, pays Rs. 1180 as hostel charges. Find the fixed charge and the cost of food per day.

**Q245** Abdul travelled 300 km by train and 200 km by taxi, it took him 5 hours 30 minutes. But if he travels 260 km by train and 240 km by taxi he takes 6 minutes longer. Find the speed of the train and that of the taxi.

**Q246** Places  $A$  and  $B$  are 80 km apart from each other on a highway. A car starts from  $A$  and other from  $B$  at the same time. If they move in the same direction, they meet in 8 hours and if they move in opposite directions, they meet in 1 hour and 20 minutes. Find the speeds of the cars.

**Q247** A man travels 600 km partly by train and partly by car. If he covers 400 km by train and the rest by car, it takes him 6 hours and 30 minutes. But, if he travels 200 km by train and the rest by car, he takes half an hour longer. Find the speed of the train and that of the car.

**Q248** After covering a distance of 30 km with a uniform speed there is some defect in a train engine and therefore, its speed is reduced to  $\frac{4}{5}$ , of its original speed. Consequently, the train reaches its destination late by 45 minutes. Had it happened after covering 18 kilometres more, the train would have reached 9 minutes earlier. Find the speed of the train and the distance of journey.



**S1.** Unique solution,  $x = -\frac{1}{4}, y = \frac{5}{2}$ .

**S2.** No solution *i.e.*, it is in-consistent.**S3.** Infinitely many solution.

**S4.**  $k = -2/3$ .

**S5.**  $k = -10/3$ .

**S6.**  $k \neq \frac{-14}{5}$ .

**S7.**  $k \neq -4$ .

**S8.**  $k = \frac{3}{2}$ .

**S9.**  $k = \frac{-9}{4}$ .

**S10.**  $k \neq 10$ .

**S11.**  $k$  is any real number.

**S12.**  $k = 4$ .

**S13.**  $k = \frac{-4}{3}$ .

**S14.**  $k = -\frac{9}{4}$ .

**S15.**  $k = -\frac{4}{3}$ .

**S16.**  $k = 4$ .

**S17.**  $k = 2$ .

**S18.**  $k = -3$ .

**S19.** 0.

**S20.** (b)  $\neq 3$ .

**S21.** (c) 6.

**S22.** (a) 10.

**S23.** (c) 6.

SMARTACHIEVERS LEARNING Pvt. Ltd.  
www.smartachievers.in

**S24. (b)**  $a = 5, b = 1.$

**S25. (d)** 2.

**S26. (c)**  $\frac{1}{2} ab.$

**S27. (d)** Intersecting or coincident.

**S28. (c)**  $a - 5b = 0.$

**S29. (b)**  $b = 2a.$

**S30. (b)** 18 sq. units.

**S31. (d)** -15.

**S32. (a)**  $\frac{1}{2}$  sq. unit.

**S33.**  $x = -2, y = -1.$

**S34.**  $x = 3, y = -2.$

**S35.** Do yourself.

**S36.**  $x = 2, y = 3.$

**S37.**  $u = 1, v = 3/2.$

**S38.**  $x = 80, y = 30.$

**S39.**  $x = -2, y = 5.$

**S40.**  $x = 5, y = -2.$

**S41.**  $x = 2a, y = -2b.$

**S42.**  $x = -21, y = 17.$

**S43.**  $x = 3, y = 4.$

**S44.**  $x = 3, y = 2.$

**S45.**  $x = 6, y = 36.$

**S46.**  $x = 14, y = 9.$

**S47.**  $x = 0.4, y = 0.6.$

**S48.**  $x = 0.5, y = 0.7.$

**S49.**  $x = 3, y = -1.$

**S50.**  $x = 11, y = -4.$

**S51.**  $x = 4, y = 3.$

**S52.**  $x = 1, y = -1.$

S53.  $am \neq bl$ .

S54.  $k = 2$ .

S55. (i)  $k \neq 3$ , (ii)  $k = 3$ . No there is no value of  $k$ .

S56.  $k = 6$ .

S57.  $x = 15$ ,  $y = 5$ .

S58.  $k = 10$ .

S59. Cost of chair = Rs. 150, Cost of table = Rs. 500.

S60. Cost of pen = Rs. 6.50, Cost of pencil = Rs. 1.50.

S61. Cost of table = Rs. 700, Cost of Chair = Rs. 200.

S62. Rs. 155.

S63.  $x = \frac{1}{3}$ ,  $y = -1$ .

S64.  $x = 2$ ,  $y = 2$ .

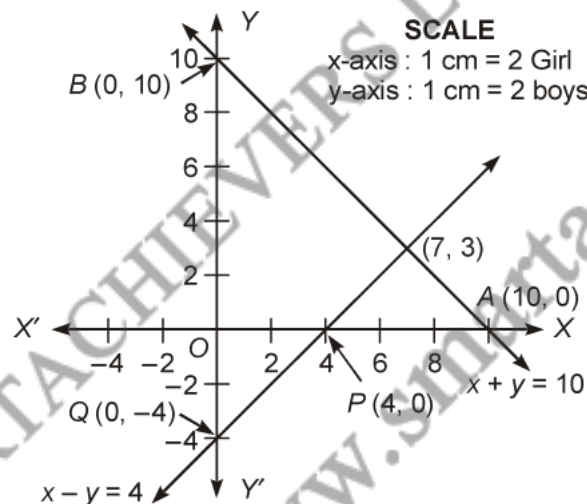
S65. My present age is 45 years, and my son's age is 15 years.

S66. 39, 13.

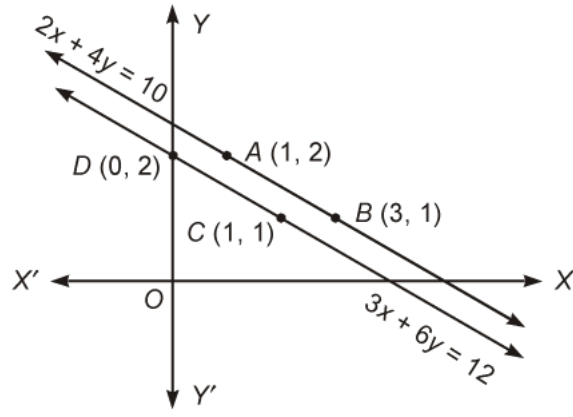
S67. 5, 3.

S68. The two numbers are 24 and 11.

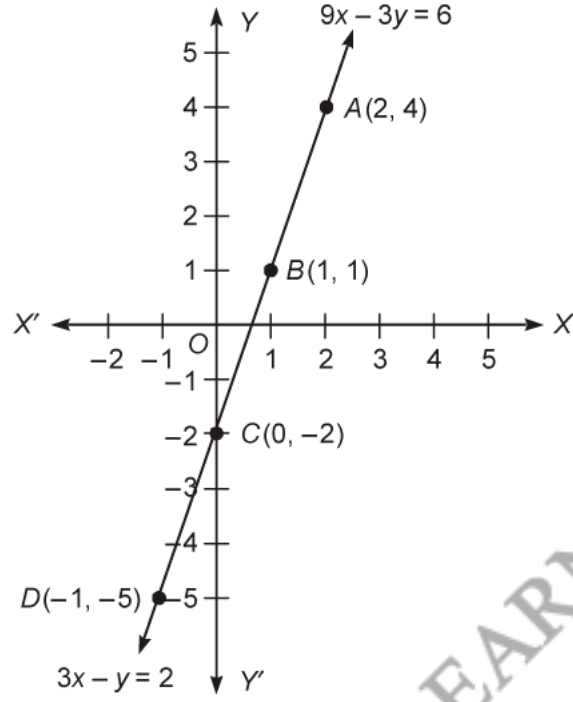
S69.  $x + y = 10$  and  $x - y = 4$ .



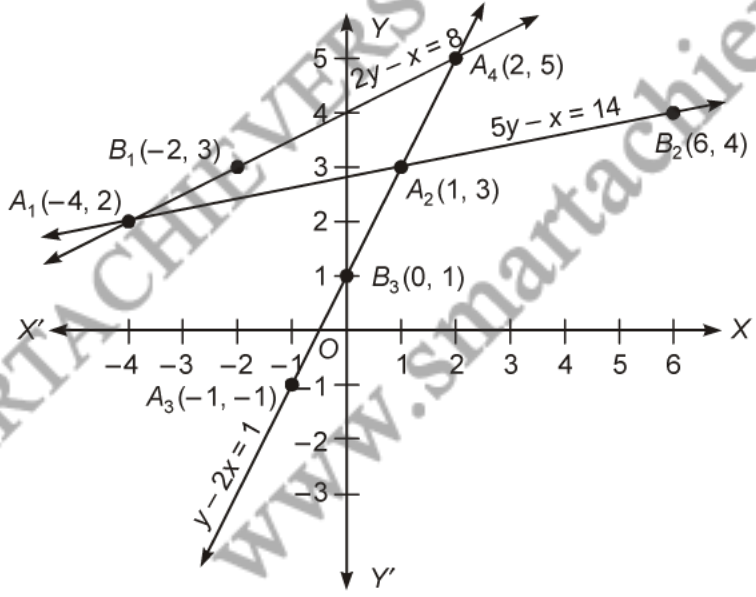
S70.



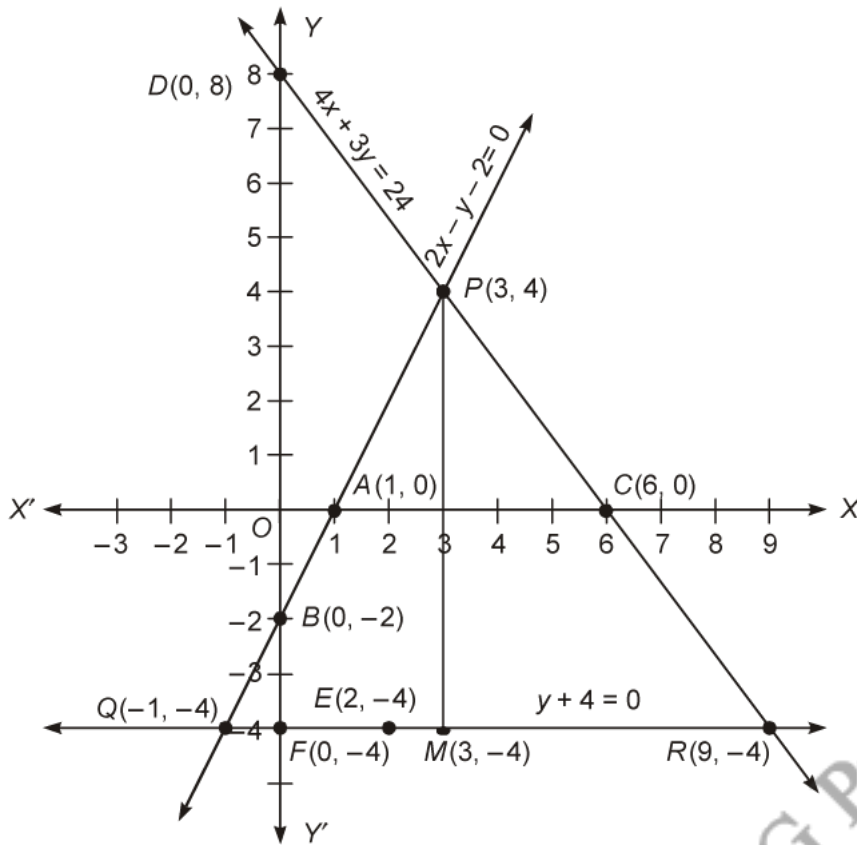
S71.



S72. (-4, 2), (1, 3) and (2, 5)



**S73.**  $P(3, 4)$ ,  $Q(-1, -4)$  and  $R(9, -4)$ ; 40 sq. units..



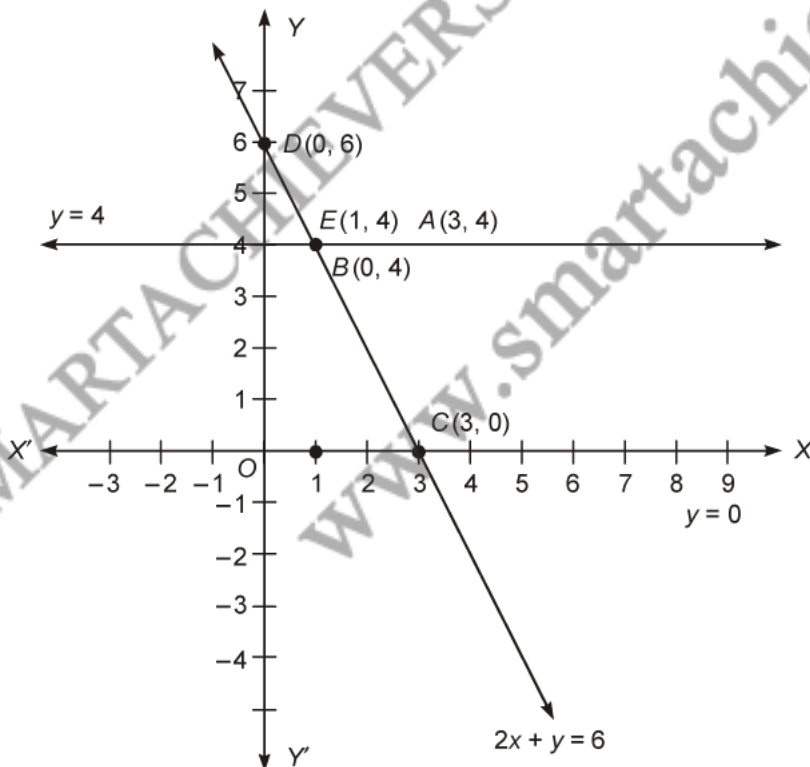
**S74.** Proved.

**S75.** Proved.

**S76.**  $x = 3$ ,  $y = -1$ .

**S77.**  $x = -1$ ,  $y = 2$ .

**S78.**  $O(0, 0)$ ,  $C(3, 0)$ ,  $E(1, 4)$  and  $B(0, 4)$ .



**S79.**  $(3, 4), (0, 2), (6, 2)$ , Area = 6 sq. unit.

**S80.** Consistent.

**S81.** (i)  $(-4, 2), (1, 3), (2, 5)$

(ii)  $(0, 0), (10/3, 0), (5/3, 5/3)$

**S82.**  $x = 3, y = 4$ , Area = 6 sq. unit.

**S83.**  $x = \frac{1}{6}, y = \frac{1}{4}$ .

**S84.**  $x = 6, y = -4, a = 0$ .

**S85.**  $x = 0, y = -4, z = -10$ .

**S86.**  $x = 3$  and  $y = -1$ .

**S87.**  $x = 3, y = 2$ .

**S88.**  $x = 3, y = 2, p = 4/3$ .

**S89.**  $x = \frac{1}{2}, y = \frac{1}{3}$ .

**S90.**  $x = \frac{1}{14}, y = \frac{1}{6}$ .

**S91.**  $x = 2, y = 1, z = 3$ .

**S92.**  $x = \frac{89}{4080}, y = \frac{89}{1512}$ .

**S93.**  $x = 2, y = 3$ .

**S94.**  $x = 1, y = 3$ .

**S95.**  $x = \frac{5}{2}, y = \frac{1}{2}$ .

**S96.**  $x = 3, y = -1$ .

**S97.**  $x = 3, y = 2$ .

**S98.**  $x = \frac{1}{2}, y = \frac{1}{3}$ .

**S99.**  $x = 4, y = 5$ .

**S100.**  $x = 1, y = -1$ .

**S101.**  $x = a, y = -b$ .

**S102.**  $x = \frac{1}{2}, y = \frac{1}{3}$ .

**S103.**  $x = \frac{-1}{2}, y = 2$ .

**S104.**  $x = a, y = b$ .

**S105.**  $x = \frac{2}{a}, y = \frac{3}{b}$ .

**S106.**  $x = \frac{1}{2}, y = \frac{1}{2}$ .

**S107.**  $x = a^2, y = b^2$ .

**S108.**  $x = a, y = b$ .

**S109.** There are 25 coins of each kind.

**S110.** A has 70 oranges and B has 50 oranges.

**S111.**  $a = 4$  and  $b = 8$ .

**S112.**  $c = 6$ .

**S113.**  $k = 4$ .

**S114.**  $a = \frac{17}{4}$  and  $b = \frac{11}{5}$ .

**S115.**  $a = 7$  and  $b = 3$ .

**S116.** The number is 36.

**S117.** The number is 23.

**S118.** The number is 49.

**S119.** The number is 41.

**S120.** The number is 53.

**S121.** The number is 93.

**S122.** The number is 36.

**S123.** Rs. 20,000 and Rs. 10,000.

**S124.** No. of pens = 13, No. of pencils = 27.

**S125.** A has 34 mangoes and B has 62 mangoes.

**S126.** Given fraction is  $\frac{7}{9}$ .

**S127.** Given fraction is  $\frac{12}{25}$ .

**S128.** Given fraction is  $\frac{7}{9}$ .

**S129.** Given fraction is  $\frac{3}{7}$ .

**S130.** Given fraction is  $\frac{5}{13}$ .

**S131** Given fraction is  $\frac{4}{5}$ .

**S132** Given fraction is  $\frac{12}{25}$ .

**S133** Given fraction is  $\frac{3}{10}$ .

**S134** Father's age is 40 years, and son's age is 15 years.

**S135** Present age of A's is 50 years and the present age of B's is 20 years.

**S136** Present age of father is 36 years and the present age of son is 12 years.

**S137** Present age of father is 34 years and the present age of son is 12 years.

**S138** Father's age = 36 years, Son's age = 12 years.

**S139** Father's age = 33 years, Son's age = 10 years.

**S140** Father's age = 34 years, Son's age = 12 years.

**S141** Father's age = 30 years, Son's age = 6 years.

**S142** Monthly rent = Rs. 1500 and mess charges per head per month = Rs. 1200.

**S143** Speed of sailor = 10 km/hr, Speed of current = 2 km/hr

**S144** 100, 80.

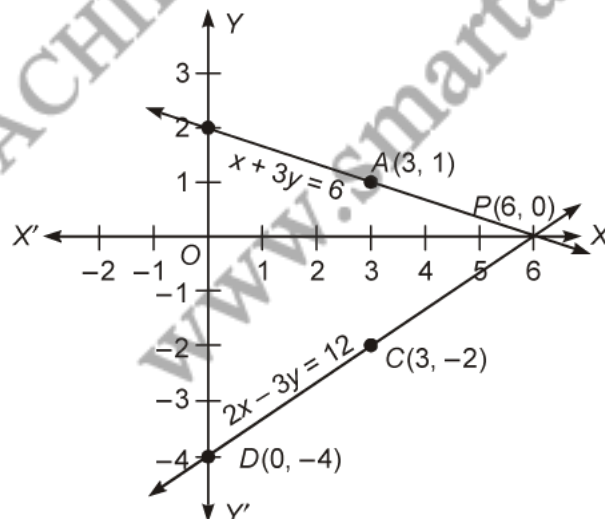
**S145** A : Rs. 62; B : Rs. 34.

**S146** X's income Rs. 6000, Y's income Rs. 5250.

**S147** Income of the first person is Rs. 1800 and the second person is Rs. 1400.

**S148** The starting salary was Rs. 1300 and annual increment is Rs. 50.

**S149**  $x = 6, y = 0$  and  $a = 24$ .



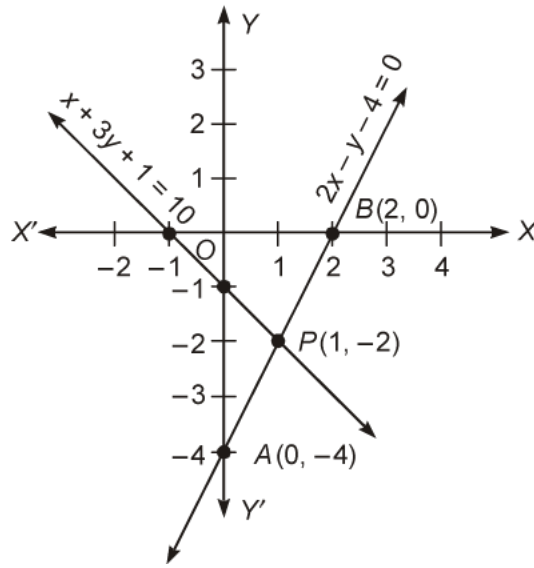
**S150** Proved.



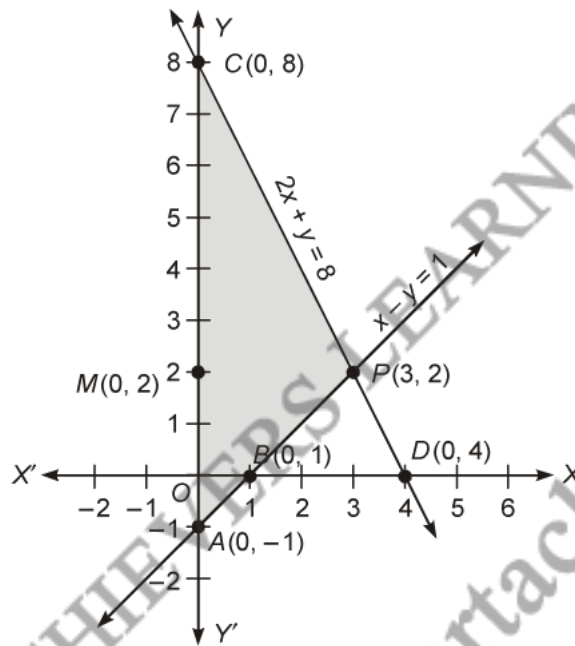
**S151.**  $A = 25^\circ$ ,  $B = 73^\circ$  and  $C = 82^\circ$ .

**S152.** One man : 15 days; One boy : 60 days.

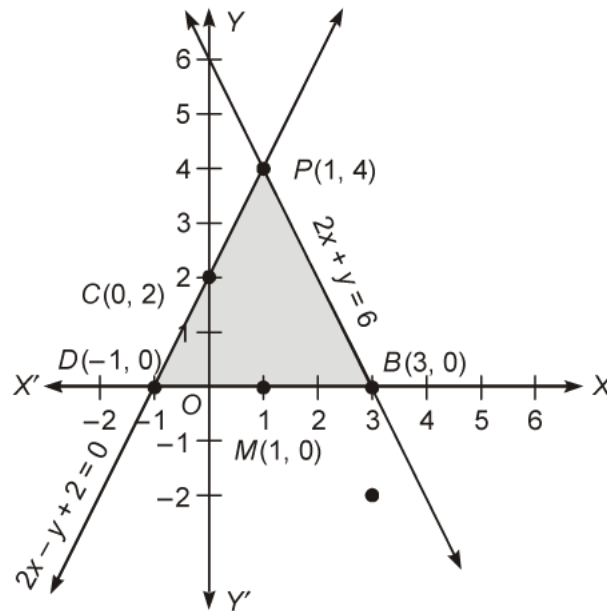
**S153.**  $x = 1$ ,  $y = -2$  is the solution and meet  $y$ -axis at  $A(0, -4)$  and  $C(0, -1)$ .



**S154.** 13.5 sq. unit.



**S155** 8 sq. unit.



**S156**  $x = 3, y = 2$ ;  $(0, 4/5), (0, 8)$ .

**S157**  $x = 3, y = 2$ ;  $(0, 3.5), (0, -4)$ .

**S158**  $x = 4, y = 3$ ;  $(0, 11), (0, -1)$ .

**S159**  $x = 2, y = 3$ ;  $(0, 6)$  and  $(0, -2)$ .

**S160**  $x = 2, y = -1$ .

**S161**  $A(0, 0), B(4, 4), C(6, 2)$ .

**S162**  $A(0, 0), B(2, 4), C(3, 3)$ .

**S163**  $x = 5, y = 0$ ;  $(5, 0), (0, 3), (0, -4)$ .

**S164**  $x = 2, y = 4$ ; Area = 12 sq. units.

**S165**  $x = 3, y = 2$ ; Area = 18 sq. units.

**S166**  $x = 8, y = 3$ .

**S167**  $x = 1, y = -1$ .

**S168**  $k = 2$ .

**S169**  $x = b, y = -a$ .

**S170**  $x = m + n, y = m - n$ .

**S171**  $x = a, y = b$ .

**S172**  $k = 2$ .

**S173**  $k = 2$ .

**S174**  $k = 4$ .

**S175**  $k = -1$ .

**S176.**  $\alpha = 4, \beta = 8.$

**S177.**  $p = 15, q = 1.$

**S178.**  $k = 2.$

**S179.**  $a = \frac{7}{18}, b = \frac{11}{5}.$

**S180.**  $\alpha = -6.$

**S181.**  $k = 7.$

**S182.**  $k = 5.$

**S183.**  $k = 5.$

**S184.**  $a = 3, b = -4.$

**S185.**  $a = -1, b = \frac{5}{2}.$

**S186.** 24.

**S187.** 63 or 36.

**S188.** 78.

**S189.** 48.

**S190.** 64.

**S191.**  $a = 5.$

**S192.**  $a = 5, b = 1.$

**S193.** 45.

**S194.** 36.

**S195.** 35.

**S196.** 64.

**S197.**  $\frac{4}{7}.$

**S198.**  $\frac{5}{9}.$

**S199.** Required fraction =  $\frac{7}{18}.$

**S200.** Father's age = 42 years, Sons's age = 10 years.

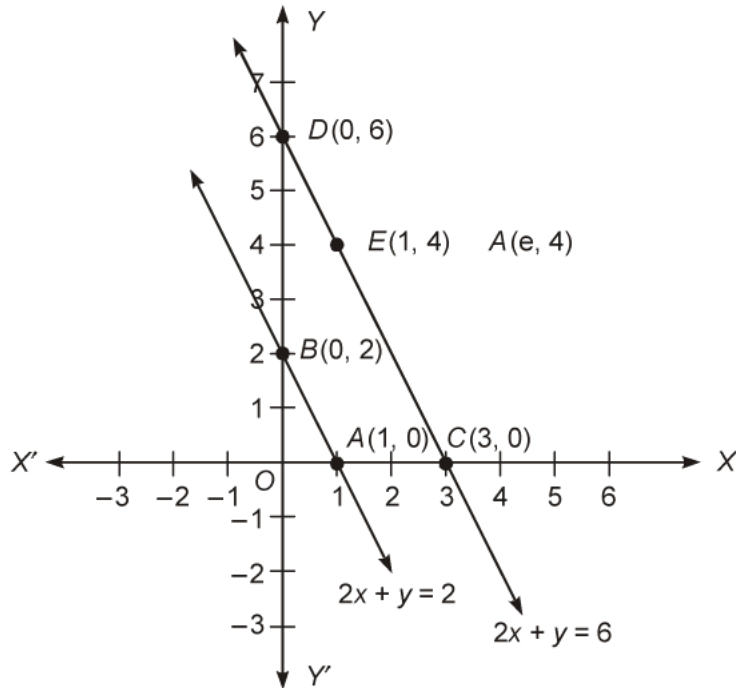
**S201.** Father's age = 45 years.

**S202.**  $\frac{5}{7}.$

**S203.**  $x = -\frac{5}{4}, y = -\frac{1}{4}.$

**S204**  $x = 2, y = 1.$

**S205**  $A(1, 0)$  and  $B(0, 2).$



Plotting point  $C(3, 0)$  and  $D(0, 6)$  and area of trapezium is 8 sq. units..

**S206**  $x = 8, y = 3.$

**S207** Required numbers are 25 and 18.

**S208** 47 or 74.

**S209**  $x = a, y = b.$

**S210**  $x = a^2, y = b^2.$

**S211**  $x = 2, y = -1, z = 1.$

**S212**  $x = 3, y = -2, z = -1.$

**S213**  $x = 1, y = 1.$

**S214**  $x = \frac{1}{2}, y = \frac{5}{4}.$

**S215**  $x = 3, y = 2.$

**S216** Speed of stream = 4 km/hr, Speed of boat = 10 km/hr.

**S217** Speed of stream = 3 km/hr, Speed of boat = 8 km/hr.

**S218** The length of the journey is 720 km.

**S219** X's speed =  $\frac{10}{3}$  km/hr, and Y's speed = 5 km/hr.

**S220** Speed of the boat in still water = 10 km/hr, and speed of the stream 2 km/hr.

**S221** Speed of train = 60 km/hr and speed of car = 80 km/hr

**S222.** Age of A is 26 years.

**S223.** Car A's speed is 40 km/hr and Car B's speed is 30 km/hr.

**S224.** A's age is  $27\frac{1}{3}$  years and B's age is  $29\frac{1}{3}$ .

**S225.** Distance = 36 km, Original speed = 4 km/hr.

**S226.** Ajit's speed = 5 km/hr, Amit's speed = 7.5 km/hr.

**S227.** 6 km/hr, 4 km/hr.

**S228.**  $\frac{10}{3}$  km/hr, 5 km/hr.

**S229.** Cost price of tea-set is Rs. 100 and lemon-set is Rs. 80 respectively.

**S230.** One man alone can finish the work in 140 days and one boy alone can finish the work in 280 days.

**S231.** The number of students in the class is 60.

**S232.** The person invested Rs. 5000 at the rate 12% per year and Rs. 700 at the rate of 10% per year.

**S233.** Length = 28 m, Breadth = 15 m.

**S234.**  $\angle A = 65^\circ$ ,  $\angle B = 55^\circ$ ,  $\angle C = 115^\circ$ , and  $\angle D = 125^\circ$ .

**S235.** 253 sq. units.

**S236.** 7.5 sq. units.

**S237.**  $x = 3$ ,  $y = 2$ ;  $A(0, 4)$ ,  $B(0, -1)$ ,  $C(3, 2)$ .

**S238.** 42, 40 Gold coins.

**S239.** Fare = Rs. 210, Reservation charge = Rs. 6.

**S240.**  $p = 5/3$ ,  $q = 1/3$ .

**S241.** 69 or 96.

**S242.**  $a = -5$ ,  $b = -1$ .

**S243.**  $x = y = ab$ .

**S244.** Fixed charge = Rs. 400; Cost of food per day = Rs. 30.

**S245.** 100 km/hr, 80 km/hr.

**S246.** 35 km/hr, 25 km/hr.

**S247.** 100 km/hr, 80 km/hr.

**S248.** Speed of the train is 30 km/hr, and the length of the journey is 120 km.