

RD PUBLIC SCHOOL BETUL
MATHEMATICS QUESTION
Pair of Linear equation in two variables

Pair of linear equations in two variables

Objective type questions (1 marks)

1. Customers are asked to stand in the lines. If one customer is extra in a line, then there would be two less lines. If one customer is less in line, there would be three more lines. Find the number of students in the class.S

- (a) 40
- (b) 50
- (c) 60
- (d) 70

2. 8 girls and 12 boys can finish work in 10 days while 6 girls and 8 boys can finish it in 14 days. Find the time taken by the one girl alone that by one boy alone to finish the work.

- (a) 120, 130
- (b) 140,280
- (c) 240,280
- (d) 100,120.S

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

- (a) 46
- (b) 48
- (c) 64
- (d) 84

4. A fraction becomes $\frac{1}{4}$ when subtracted from the numerator and it becomes $\frac{1}{3}$ when 8 is added to its denominator. Find the fraction.

- (a) $\frac{4}{12}$
- (b) $\frac{3}{13}$
- (c) $\frac{5}{12}$
- (d) $\frac{11}{7}$.A

5. Five years ago, A was thrice as old as B and ten years later, A shall be twice as old as B. What is the present age of A.

- (a) 20
- (b) 50
- (c) 60

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(d) 40.A

6. What will be the solution of these equations $ax+by=a-b$, $bx-ay=a+b$

(a) $x=1, y=2$

(b) $x=2, y=-1$

(c) $x=-2, y=-2$

(d) $x=1, y=-1$.U

7. If $x=a, y=b$ is the solution of the pair of equation $x-y=2$ and $x+y=4$ then what will be value of a and b

(a) 2,1

(b) 3,1

(c) 4,6

(d) 1,2.U

8. Rozly can row downstream 20km in 2 hours, and the upstream 4km in 2 hours. What will be the speed of rowing in still water? S

(a) 6km/hr

(b) 4km/hr

(c) 3km/hr

(d) 7km/hr

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Choose the correct answer from the given four options:

1. Graphically, the pair of equations

$$6x - 3y + 10 = 0$$

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

represents two lines which are

- (A) intersecting at exactly one point. (B) intersecting at exactly two points.
(C) coincident. (D) parallel.
2. The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ have
(A) a unique solution (B) exactly two solutions
(C) infinitely many solutions (D) no solution
3. If a pair of linear equations is consistent, then the lines will be
(A) parallel (B) always coincident
(C) intersecting or coincident (D) always intersecting
4. The pair of equations $y = 0$ and $y = -7$ has
(A) one solution (B) two solutions
(C) infinitely many solutions (D) no solution
5. The pair of equations $x = a$ and $y = b$ graphically represents lines which are
(A) parallel (B) intersecting at (b, a)
(C) coincident (D) intersecting at (a, b)
6. For what value of k , do the equations $3x - y + 8 = 0$ and $6x - ky = -16$ represent coincident lines?

- (A) $\frac{1}{2}$ (B) $-\frac{1}{2}$ (C) 2 (D) -2

7. If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, then the value of k is

- (A) $-\frac{5}{4}$ (B) $\frac{2}{5}$ (C) $\frac{15}{4}$ (D) $\frac{3}{2}$

8. The value of c for which the pair of equations $cx - y = 2$ and $6x - 2y = 3$ will have infinitely many solutions is

- (A) 3 (B) -3 (C) -12 (D) no value

9. One equation of a pair of dependent linear equations is $-5x + 7y = 2$. The second equation can be

- (A) $10x + 14y + 4 = 0$ (B) $-10x - 14y + 4 = 0$
(C) $-10x + 14y + 4 = 0$ (D) $10x - 14y = -4$

10. A pair of linear equations which has a unique solution $x = 2, y = -3$ is

- (A) $x + y = -1$ (B) $2x + 5y = -11$
 $2x - 3y = -5$ $4x + 10y = -22$
(C) $2x - y = 1$ (D) $x - 4y - 14 = 0$

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Fill in the blanks:

- 22) An equation of the form $ax+by+c=0$ where a,b,c are real numbers and where atleast one of a or b is not zero is called equation.K
- 23) The general form of linear equation isK
- 24) A linear equation in two variables has solutions.K
- 25) The graph of a linear equation in two variables is aK
- 26) Two lines are drawn in the same plane , then the lines may intersect at point.K
- 27) The graph of a pair of linear equations in two variables then the lines intersect at a one point gives the solution of the equations.K
- 28) If the lines coincide then they are solutions.K
- 29) If the lines are parallel then the pair of equations has solutions.K
- 30) $3x+2y=5, 2x-3y=7$ then the pair of linear equations isK
- 31) $2x-3y=8, 4x-6y=9$ then the pair of linear equations isK
- 32) Sum of the complimentary angles isK
- 33) Sum of the supplementary angles isK
- 34) The value of x in the equation $2x-(4-x)=5-x$ isK
- 35) The equation $x-4y=5$ has solutions.K
- 36) The sum of two numbers is 80 and their ratio is 3:5 then the first number isA
- 37) The value of x in the equation $5x-8=2x-2$ isU
- 38) For what value of P the following pair of equations has unique solution $2x+py=-5, 3x+3y=-6$ isK
- 39) A system of two linear equations in two variables is said to be constant if it has at least solutions.K
- 40) No of solutions for the equation $3(7-3y)+4y=16$ is.....K

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- 41) A system of linear equations in two variables is said to be inconsistent if it has solution.K
- 42) When two lines in the same plane may intersect is.....K
- 43) $3x+2y-80=0$, $4x+3y-110=0$ solution for this linear equation isU
- 44) $X+2y-30=0$, $2x+4y-66=0$ these lines representK
- 45) $4x+9y-13=0$ no of unknowns in this linear equation isK
- 46) In the equation $4x+3y-4=0$ then $a=.....$, $c=.....$ K
- 47) Sum of two numbers is 44 then the equation form isK
- 48) $4x-2y=0$, $2x-3y=0$ then $a_1=.....$, $c_1=.....$ K
- 49) The difference of two numbers is 48 then the equation is _____A
- 50) A_____ in two variables can be solved using various methods.K

Very short answer type questions (1 mark)

51. Find k for which $5x + 10y - 2 = 0$ and $10x + ky + 4 = 0$ lines are parallel to each other.U
52. For what k the equations $2x + 6y - 1 = 0$ and $4x + ky - 3 = 0$ are parallel?U
53. Identify the nature of solution
 $2x + 3y + 5 = 0$
 $4x + 6y + 10 = 0$.U
54. If $2x + 3y = 5$, find an equation which is intersecting to this.K
55. For what value of k, pair of linear equations $kx + 3y + 2 = 0$, $2x + y + 3 = 0$ has no solutions?U
56. If a line is represented $2x - 3y = 5$, find another line which is intersecting to this.K
57. $2x + 3y + 4 = 0$ write another equation to this equation which is coincident.K
58. Check whether the following system of equations is consistent or not.
 $2x + 3y = -8$, $4x + 6y = 16$.U
59. Given $2x - 7y = 12$, write another line which is parallel to the line.K
60. Given: $3x + 4y = 5$, write another equation of line which is parallel to this line.K
61. A pair of linear equations are given by $3x + 4y = 5$, $6x + 8y = 7$. Find the nature of the lines.U
62. For what value of k, $2x + 3y = 7$
 $4x + ky = 14$
has infinitely many solutions?U
63. The system of equation $x - 4y = 8$, $3x - 12y = 24$
(a) Has infinitely many solution
(b) Has not solution
(c) Has a unique solution
(d) May or may not have solution.K

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64. Check whether $x = 1$, $y = -2$ is a solution of the system of simultaneous linear equations

$$2x + y = 0$$

$$x - y = 3.U$$

65. For the equation $2x - 3y = 5$ write an equation which is coincident.K

66. What is the nature of lines given by

$$2x + 3y = 5$$

$$4x + 6y = 7.K$$

67. Find k for which $3x + 3ky = 2$, $2x + 5y + 14 = 0$ are parallel.U

68. Find the no. of solutions of the pair of equations $x + 2y - 4 = 0$ and $2x + 4y - 8 = 0.U$

69. For what value of k , the pair of equations $kx + y = 2$ & $4x - 2y = 6$ has a unique solution?U

70. Find the no. of solution to the equations $2x - 3y = 5$ and $10x - 6y = 7.U$

Short answer type questions (2 marks)

71.If α and β are the zeros of $x^2 + 2x + 15$, find the value of $1/\alpha + 1/\beta$. U

72. If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are inconsistency find $k.U$

73.Solve $24x + 23y = 117$

$$23x + 24y = 118.S$$

74.One third of the perimeter of a rectangular garden, whose length is 6 m more than breadth is 28 m. Find the dimensions of the garden.A

75. For what value of k , the following systems of equations have infinitely many solutions?

$$3x - 4y = 5$$

$$6x + (2k + 1)y = 10.U$$

76. For what value of k , with the following system of equations have infinitely many solutions?

$$4x + 5y = 7$$

$$(k + 2)x + 10y = 2k + 2.U$$

77. Two numbers are in ratio of 4 : 5. If 8 is subtracted from each of the numbers the ratio becomes 3 : 4. Find the numbers.A

79. Solve the following

$$2x + 3y = 7$$

$$3x - 5y = 1.U$$

80. Find the value of P for which the system of end has no solution.

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

$$2x - y + 1 = 0.U$$

81. If the sum of two consecutive odd integers is 20, find the numbers.A

82. Find the equation of a straight line passing through $(1, 2)$ and perpendicular to the line $y = 7.S$

83. Solve the following system of equations:

$$3x - y = 7,$$

$$4x - 5y = 2.U$$

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84. Solve for x and y
 $29x + 32y = 26$
 $32x + 29y = 35$.U
85. Solve for x & y : $99x + 101y = 4989$
 $101x + 99y = 501$.S
86. Check whether the system of linear equations $3x + 4y - 6 = 0$ and $6x + 8y - 12 = 0$ is consistent.U
87. For what value of p, the system of equation has no solution.
 $(p + 1)x + (p + 2)y = 10$
 $8x + 10y = 5$.U
88. Determine a and b for which the following system of equations has infinite no. of solutions
 $4x - (a - 4)y = 4b + 2$
 $12x - (2a - 3)y = 3b + 1$.U
89. Determine whether the following system of equation has a unique solution, no solutions or infinity many solutions.
 $3x - 7y = 5$, $6x - 14y = 10$.U
90. For what value of k, $3x + 2y = 4$ and $6x + (k + 2)y = 3k + 2$ will have infinitely many solutions.U
91. Solve for x and y : $x + 8y = 36$, $3x - 2y = 4$.U
92. For what value of k, the system of equations has a unique solution, $3x + ky = 5$; $2x - 5y = 9$.U
93. Solve : $3x - 2y = 4$, $4x + y = 9$.U
94. For which value of p, does the pair of equation has a unique solution?
 $6x + py + 8 = 0$
 $2x + 3y + 4 = 0$.U
95. Solve by method of substitution :
 $2x + 3y = 10$, $x + y = 4$.U
96. For what value of k will the equations $x + 3y + 5 = 0$, $3x + ky + 15 = 0$ represent coincident lines?U
97. For what value of k, the system of equations has infinitely many solutions.
 $2x + 3y = 7$
 $(k + 1)x + (2k - 1)y = 4k + 1$.U
98. $12x + 6y = 2c - 6$ and $24x + 2cy = 2c$ has infinitely many solution for what value of c.U
99. For what value of k, for which the system of has infinitely many solutions.
 $3x + 4y = 6$
 $kx + 12y = 18$.U
100. Write the condition for the following system of linear equations have a unique solution.
 $ax + by = c$
 $px + qy = d$.K

Short answer type questions (3 marks)

101. Solve for x & y

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$$3x + \frac{y}{4} = \frac{7}{4} \quad \dots(1)$$

$$\frac{x}{6} + \frac{2y}{3} = -\frac{5}{3} \quad \dots(2)$$

102. Solve: $363x + 481y = 2169$

$481x + 363y = 2051$.S

103. Solve : $48x + 32y = 64$

$32x + 48y = 16$.S

104. Solve: $38x + 42y = 123$

$42x + 38y = 117$.S

105. The monthly incomes of A and B are in ratio of 6 : 4 & their monthly expenses are in ratio 4 : 2. If each saves Rs 20000/per month, find monthly income of each.

106. The sum of the digits of a two digit number is 9. 9 times the number is twice the number obtained by reversing the digits. Find the number.A

107. Solve : $39x + 43y = 121$

$43x + 39y = 125$.S

108. The sum of a two digit number and the number obtained by reversing the digits is 55. If the digits of a number differ by 1, find the number.A

109. The sum of numerator & denominator of a fraction is 13. If 3 is added to numerator & 5 to denominator, the fraction becomes $\frac{1}{2}$. Find the fraction.A

110. A man has 60 notes in all of Rs 10 and Rs 20 denomination. If the total worth of notes is Rs 800, find how many notes of each type?A

111. Find the area of a triangle whose three sides are having the equations $x + y = 2$, $x - y = 0$ and $x + 2y - 6 = 0$.U

112. Solve the following equation $2x + 5y = 11$ and $4x - 3y = 9$.U

113. The denominator of a rational number is greater than its numerator by 8. If the denominator is decreased by 1 and numerator is increased by 17, the number obtained is $\frac{3}{2}$. Find the rational number.S

114. For what values of k will the following pair of linear equations have infinitely many solutions?

$kx + 3y - (k - 3) = 0$; $12x + ky - k = 0$.U

115. Solve the following system of linear equations:

$(a - b)x + (a + b)y = a^2 - 2ab + b^2$

$(a + b)(x + y) = a^2 + b^2$.S

116. Solve : $\frac{7}{x+1} + \frac{1}{y-1} = 2$

$\frac{14}{x+1} - \frac{4}{y-1} = -2$.S

117. Two numbers are in ratio of 8 : 9. If 5 is subtracted from each, the ratio becomes 7 : 8. find the numbers.A

118. One says, give me a hundred friend ! I shall then become twice as rich as you. "The other replies", If you give me ten, I shall be six times as rich as you". Tell me what is the amount of their capitals?A

119. In ΔABC , $\angle C = 3 \angle B = 2(\angle A + \angle B)$ find the three angles of the triangle.U

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120. Draw the graphs of the equation $x = y$ and $x = 3$ and find the area bounded by the lines & X-axis. S

121. Show graphically that the pair of linear equation has infinitely many solutions. $2x - y = 2$, $4x - 2y = 4$. S

122. Solve by method of substitution

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

$$x - \frac{3}{2}y = 6 \quad .K$$

123. Solve by substitution $2x + 3y = 3$

$$3x - 2y = 11.K$$

124. Solve the following by method of elimination.

$$8x + 5y = 9$$

$$3x + 2y = 4.K$$

125. Solve: $\frac{x}{3} + y = 0.6$

$$x/4 - y = 0.5. U$$

126. Solve: $\sqrt{3}x - \sqrt{2}y = 0$

$$\sqrt{2}x - \sqrt{8}y = 0. U$$

127. The path of train A is given by $2x + 3y - 6 = 0$ and the path of train B is given by $4x + 6y - 12 = 0$

Represent this situation graphically. S

128. Solve graphically the system of equations :

$$2x + y = 5$$

$$3x - y = 5.S$$

129. Solve the following by method of cross multiplication :

$$3x + 2y = 11$$

$$2x + 3y = 4.S$$

130. Solve: $\frac{1}{x} + \frac{1}{y} = \frac{5}{6}$ and $\frac{2}{x} - \frac{3}{y} = -\frac{5}{6}.S$

131. Solve for x and y: $11/x - 1/y = 10$ & $9/x - 4/y = 5. S$

132. Solve using cross multiplication method: $5x + 4y - 4 = 0$ & $x - 12y - 20 = 0. K$

133. A man has certain notes of denomination ₹ 20 and ₹ 5 which amount to ₹ 380. If the number of notes of each kind are interchanged, they amount to ₹ 60 less than before. Find the number of notes of each denomination. A

134. Find the value of 'k' for which the following system of equations represents a pair of coincident lines: $x + 2y = 3$; $(k - 1)x + (k + 1)y = k + 3. U$

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135. Check graphically, whether the pair of equations $x + 3y = 6$ & $2x - 3y = 12$ is consistent. If so, then solve them graphically. S

136. The path of a train A is given by the equation $x + 2y - 4 = 0$ and path of another train B is given by the equation $2x + 4y - 12 = 0$. Represent this situation graphically and find whether the two trains meet each other at some place. S

137. Form a pair of linear equations in two variables from the data given and solve it graphically: Tina went to a book shop to get some story books and textbooks. When her friends asked her how many of each she had bought, she answered – ‘The number of textbooks is two more than twice the number of story books bought. Also, the number of textbooks is four less than four times the number of story books bought. Help her friends to find the number of textbooks and story books she had bought. S

138. Determine graphically, the coordinates of the vertices of a triangle whose sides are graphs of the equations $2x - 3y + 6 = 0$, $2x + 3y - 18 = 0$ and $y - 2 = 0$. Also, find the area of this triangle. S

Long answer type questions (4 marks)

139. The sum of digits of a two digit number is 13. If the number is subtracted from one obtained by interchanging the digits, the result is 45. Find the number. A

140. If the length is 2 cm more than breadth and if the length & breadth are increased by 2 cm each, the area gets doubled. Find the length & breadth.

141. The ratio of incomes of two persons is 18 : 14 and the ratio of their expenditures is 8 : 6. If each of them manages to save Rs. 4000 per month, find their monthly incomes.

142. The sum of digits of a two digit number is 11. The number obtained by interchanging the digits of the given number exceeds that number by 27. Find the number.

143. Solve for x & y : $\frac{x}{b} + \frac{y}{a} = 2$
 $bx - ay = b^2 - a^2$

144. A boat goes 12 km upstream and 14 km downstream in 3 hrs. It goes 15 km upstream & 10.5 km downstream in 3 hrs 15 mins. Find the speed of the boat in still water.

145. Solve the following:

$$\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 36; \quad \frac{1}{x} + \frac{3}{y} - \frac{1}{z} = 28; \quad \frac{1}{x} + \frac{1}{3y} + \frac{1}{2z} = 20.$$

146. Solve:

$$3x - 2y + z = 2$$

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$$2x + 3y - z = 5$$

$$x + y + z = 6$$

147. A fraction becomes $\frac{4}{5}$ if 1 is added to both numerator and denominator. If, however, 5 is subtracted from both numerator and denominator, the fraction becomes $\frac{1}{2}$. Find the fraction.

148. A two digit number is such that the product of the digits is 12. When 9 is added to the number, the digits interchange their places. Determine the number.

149. Solve : $5(2U + V) = 9UV$

and $5(U + 3V) = 13UV$, where $U \neq 0, V \neq 0$

150. A two digit number is such that the sum of the digits is 10. The number obtained by reversing the digits is greater than the original number 18. Find the number.

151. The sum of a two digit number and the number obtained by reversing the order of its digits is 121. If the digits differ by 3, find the number.

152. The ratio of income of two persons is 9 : 7 and the ratio of their expenditures is 4 : 3. If each of them saves Rs. 2000 per month, find their monthly incomes.

153. In a fraction, the numerator is greater than the denominator by 4. If 3 is added to numerator, the fraction becomes 2. Find the fraction.

154. Joseph travelled 300 km by train & 200 km by taxi, it took him 5 hrs 30 mins. But if he travels 260 km by train and 240 km by taxi, he takes 6 mins longer. Find the speed of the train and that of taxi.

156. The taxi charges in a city comprise of a fixed charge together with the charge for the distance covered. For a journey of 20 km the charge paid is Rs. 170 and for a journey of 30 km the charge paid is Rs. 250. Find the charge for travelling 70 km.

157. Points A and B are 120 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 6 hrs. & if they go in opposite directions they meet in $\frac{6}{5}$ hrs. Find their speeds.

158. The sum of a two digit number and the number obtained by reversing the digits is 132. If 12 is added to the number, the number becomes 5 times the sum of the digits. Find the number

159. Solve : $\frac{66}{x+y} + \frac{50}{x-y} = 16$

$$\frac{55}{x+y} + \frac{40}{x-y} = 13$$

160. For Uttarakhand flood victims' two sections A and B of class X contributed ₹ 1500. If the contribution of section A was ₹ 100 less than that of section B, find graphically the amounts contributed by both the sections. [CBSE 2016]

161. Three lines $3x + 5y = 15$, $6x - 5y = 30$ and $x = 0$ are enclosing a beautiful triangular park. Find the points of intersection of the lines graphically and the area of the park if all measurements are in km. [CBSE 2016]

162. Some people collected money to be donated in two Old Age Homes. A part of the donation is fixed and remaining depends on the number of old people in the home. If they donated ₹

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14500 in the home having 60 people and ₹ 19500 with 85 people, find the fixed part of donation and the amount donated for each people. What is the inspiration behind this? [CBSE 2016]

163. While teaching about the Indian National flag, teacher asked the students that how many lines are there in Blue colour wheel? One student replies that it is 8 times the number of colours in the flag. While other says that the sum of the number colours in the flag and number of lines in the wheel of the flag is 27. Convert the statements given by the students into linear equation of two variables. Find the number of lines in the wheel. [CBSE 2015]

164. Determine the value of k for which the following system of linear equations has infinite number of solutions: $(k - 3)x + 3y = k$ & $kx + ky = 12$. [CBSE 2015]

165. Draw the graph of the following pair of linear equation: $x + 3y = 6$ & $2x - 3y = 12$. Find the ratio of the areas of the two triangles formed by first line, $x = 0$, $y = 0$ and second line, $x = 0$, $y = 0$. [CBSE 2015]

166. Places A and B are 200km apart on a high way. One car starts from A and another from B at the same time. If the cars travel in the same directions at different speeds, they meet in 10 hours. Find the speeds of the two cars. [CBSE 2014]

167. Show graphically that the system of equations $x + 2y = 4$ and $7x + 4y = 18$ is consistent with a unique solution $(2, 1)$. [CBSE 2014]

168. Solve for x and y : $99x + 101y = 1499$; $101x + 99y = 1501$. [CBSE 2010, 2011, 2012, 2013, 2014]

169. The age of father is equal to sum of ages of his 4 children. After 30 years, sum of the ages of the children will be twice the age of the father. Find the age of the father. [CBSE 2013]

170. A person can row a boat 8 km upstream and 24 km downstream in 4 hours. He can row 12 km downstream and 12 km upstream in 4 hours. Find the speed of rowing in still water and the speed of the current. [CBSE 2013]

171. Solve for x and y : $37x + 43y = 123$; $43x + 37y = 117$. [CBSE 2010, 2011, 2012]

172. Draw the graph of the equations: $x - y + 1 = 0$ & $3x + 2y - 12 = 0$. Determine the coordinates of the vertices of the triangle formed by these lines and the x - axis and shade the triangular region. Also calculate the area of the triangle so formed. [CBSE 2011]

173. The sum of a 2 digit number and number obtained by reversing the order of digits is 99. If the digits of the number differ by 3, find the number. [CBSE 2011]

174. Check graphically whether the pair of linear equations $4x - y - 8 = 0$ and $2x - 3y + 6 = 0$ is consistent. Also determine the vertices of the triangle form by these lines and x - axis. [CBSE 2006, 2011]

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175. The sum of the digits of a two digit number is 9. Nine times this number is twice the number obtained by reversing the digits. Find the number. [CBSE 2010]

176. A leading library has a fixed charge for the first three days and an additional charge for each day thereafter. Sarita paid ₹ 27 for a book kept for seven days. While Susy paid ₹ 21 for the book she kept for five days. Find the fixed charge and the charge for each extra day. [CBSE 2010]

177. Solve the following system of linear equations by elimination method: $6(ax + by) = 2a + 2b$ & $6(bx - ay) = 3b - 2a$. [CBSE 2006, 2004]