**CHAPTER 3**

**PAIR OF LINEAR EQUATION IN TWO VARIABLES**

1. The value of $k$ for which the system of linear equations $x + 2y = 3$, $5x + ky + 7 = 0$ is inconsistent is
   (a) $-\frac{14}{3}$
   (b) $\frac{2}{5}$
   (c) 5
   (d) 10
   Sol: www.cbse.site/ma/cm101

2. The value of $k$ for which the system of equations $x + y - 4 = 0$ and $2x + ky = 3$, has no solution, is
   (a) -2
   (b) $\neq 2$
   (c) 3
   (d) 2
   Sol: www.cbse.site/ma/cm102

3. For which value(s) of $p$, will the lines represented by the following pair of linear equations be parallel
   
   $3x - y - 5 = 0$
   
   $6x - 2y - p = 0$

   (a) all real values except 10
   (b) 10
   (c) 5/2
   (d) 1/2
   Sol: www.cbse.site/ma/cm103

4. The 2 digit number which becomes $\frac{1}{5}$th of itself when its digits are reversed. The difference in the digits of the number being 1, then the two digits number is
   (a) 45
   (b) 54
   (c) 36
   (d) None of these
   Sol: www.cbse.site/ma/cm104

5. In a number of two digits, unit’s digit is twice the tens digit. If 36 be added to the number, the digits are reversed. The number is
   (a) 36
   (b) 63
   (c) 48
   (d) 84
   Sol: www.cbse.site/ma/cm105

6. If $3x + 4y : x + 2y = 9 : 4$, then $3x + 5y : 3x - y$ is equal to
   (a) 4 : 1
   (b) 1 : 4
   (c) 7 : 1
   (d) 1 : 7
   Sol: www.cbse.site/ma/cm106

7. A fraction becomes 4 when 1 is added to both the numerator and denominator and it becomes 7 when 1 is subtracted from both the numerator and denominator. The numerator of the given fraction is
   (a) 2
   (b) 3
   (c) 5
   (d) 15
   Sol: www.cbse.site/ma/cm107

8. $x$ and $y$ are 2 different digits. If the sum of the two digit numbers formed by using both the digits is a perfect square, then value of $x + y$ is
   (a) 10
   (b) 11
   (c) 12
   (d) 13
   Sol: www.cbse.site/ma/cm108
9. The pair of equations $3x + y = 8$, $81x - y = 3$ has
(a) no solution
(b) unique solution
(c) infinitely many solutions
(d) \( x = 2, y = 17 \)

Sol: www.cbse.site/ma/cm109

10. The pair of linear equations $2kx + 5y = 7$, $6x - 5y = 11$ has a unique solution, if
(a) \( k \neq -3 \)
(b) \( k \neq -\frac{2}{3} \)
(c) \( k \neq 5 \)
(d) \( k \neq \frac{2}{9} \)

Sol: www.cbse.site/ma/cm110

11. The pair of equations $x + 2y + 5 = 0$ and $-3x - 6y + 1 = 0$ has
(a) a unique solution
(b) exactly two solutions
(c) infinitely many solutions
(d) no solution

Sol: www.cbse.site/ma/cm111

12. 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

Sol: www.cbse.site/ma/cm112

13. The pair of equations $y = 0$ and $y = -7$ has
(a) one solution
(b) two solutions
(c) infinitely many solutions
(d) no solution

Sol: www.cbse.site/ma/cm113

14. 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)

Sol: www.cbse.site/ma/cm114

15. 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

Sol: www.cbse.site/ma/cm115

16. If the lines given by $3x + 2ky = 2$ and $2x + ky + 1 = 0$ are parallel, then the value of \( k \) is
(a) \( -\frac{5}{4} \)
(b) \( \frac{2}{5} \)
(c) \( \frac{15}{4} \)
(d) \( \frac{3}{2} \)

Sol: www.cbse.site/ma/cm116

17. The value of \( c \) for which the pair of equations $cx - y = 2$ and $6x - 2y = 3$ will have is
(a) 3
(b) 3
(c) 12
(d) no value

Sol: www.cbse.site/ma/cm117

18. One equation of a pair of dependent linear equations $-5x + 7y = 2$. The second equation can be
(a) $10x + 14y + 4 = 0$
(b) $-10x - 14y + 4 = 0$
(c) $-10x + 14y + 4 = 0$
(d) $10x - 14y = -4$

Sol: www.cbse.site/ma/cm118

19. If $x = a$ and $y = b$ is the solution of the equations $x - y = 2$ and $x + y = 4$, then the values of \( a \) and \( b \)
are, respectively
(a) 3 and 5
(b) 5 and 3
(c) 3 and 1
(d) −1 and −3
Sol : www.cbse.site/ma/cm119

20. Aruna has only ₹ 1 and ₹ 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is ₹ 75, then the number of ₹ 1 and ₹ 2 coins are, respectively
(a) 35 and 15
(b) 35 and 20
(c) 15 and 35
(d) 25 and 25
Sol : www.cbse.site/ma/cm120

21. The father’s age is six times his son’s age. Four years hence, the age of the father will be four times his son’s age. The present ages (in year) of the son and the father are, respectively. 
(a) 4 and 24
(b) 5 and 30
(c) 6 and 36
(d) 3 and 24
Sol : www.cbse.site/ma/cm121

22. Assertion : Pair of linear equations : 
\[ xy = 9 \]
\[ 3y + 12 = 0 \]
\[ 8x + 6y + 24 = 0 \]
have infinitely many solutions.
Reason : Pair of linear equations 
\[ a_1x + b_1y + c_1 = 0 \]
and 
\[ a_2x + b_2y + c_2 = 0 \]
have infinitely many solutions, if \( \frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} \).
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.
Sol : www.cbse.site/ma/cm122

23. Assertion : 
\[ x + y - 4 = 0 \]
and 
\[ 2x + ky - 3 = 0 \]
have no solution if \( k = 2 \).
Reason : 
\( a_1x + b_1y + c_1 = 0 \)
and 
\( a_2x + b_2y + c_2 = 0 \)
are consistent if \( \frac{a_1}{a_2} \neq \frac{b_1}{b_2} \).
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.
Sol : www.cbse.site/ma/cm123

24. If the equations \( kx - 2y = 3 \) and \( 3x + y = 5 \) represent two intersecting lines at unique point, then the value of \( k \) is 
(a) \( k = -6 \)
(b) \( k \neq -6 \)
(c) \( k = 4 \)
(d) \( k \neq 4 \)
Sol : www.cbse.site/ma/cm124

25. What do you say about the solution of the pair of linear equations \( y = 0 \) and \( y = -5 \)?
(a) no solution
(b) unique solution
(c) infinitely solution
(d) can’t say anything
Sol : www.cbse.site/ma/cm125

26. If \( am = bl \), then what do you say about the solution of the pair of linear equations \( ax + by = c \) and \( lx + my = n \) ?
(a) no solution
(b) unique solution
(c) infinitely solution
(d) can’t say anything
Sol : www.cbse.site/ma/cm126

27. If \( ad \neq bc \), then what do you say about the solution of the pair of linear equations \( ax + by = p \) and \( cx + dy = q \) ?
(a) no solution
(b) unique solution
(c) infinitely solution
(d) can’t say anything
Sol : www.cbse.site/ma/cm127

28. Two lines are given to be parallel. The equation of one of the lines is $4x + 3y = 14$, then the equation of the second line will be
(a) $12x + 9x = 42$
(b) $12x + 9y = 5$
(c) $12x + 9y = 15$
(d) $12x + 9y = 32$
Sol : www.cbse.site/ma/cm128

29. Which of the following value of $k$ should be selected so that the pair of equations $x + 2y = 5$ and $3x + ky + 15 = 0$ has a unique solution ?
(a) $k \neq 5$
(b) $k \neq 6$
(c) $k = 5$
(d) $k = 6$
Sol : www.cbse.site/ma/cm129

30. If $2x + y = 23$ and $4x - y = 19$, the value of $(5y - 2x)$ and $(\frac{x}{2} - 2)$ will be
(a) $\frac{-7}{2}$ and 31
(b) 31 and $-\frac{7}{2}$
(c) 37 and $\frac{7}{2}$
(d) $\frac{7}{2}$ and 37
Sol : www.cbse.site/ma/cm130

31. What do you say about the lines represented by $2x + y = 3$ and $4x + 2y = 6$ ?
(a) lines are parallel
(b) lines are coincident
(c) lines are intersecting
(d) can’t say anything
Sol : www.cbse.site/ma/cm131

32. What do you say about the following pair of linear equation?
$3x + 2y = 8, \ 6x - 4y = 9$
(a) Lines are parallel
(b) pair of linear equation is consistent
(c) pair of linear equation is inconsistent
(d) Lines are coincident
Sol : www.cbse.site/ma/cm132

33. What do you say about the lines represented by $2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$
(a) lines are parallel
(b) lines are coincident
(c) lines are intersecting
(d) can’t say anything
Sol : www.cbse.site/ma/cm133

34. Given the linear equation $3x + 4y = 9$. Select another linear equation in these two variables such that the geometrical representation of the pair so formed is intersecting lines.
(a) $3x - 5y = 10$
(b) $6x + 8y = 18$
(c) $8x + 12y = 18$
(d) above all
Sol : www.cbse.site/ma/cm134

35. For what value of $p$ does the pair of linear equations $4x + py + 8 = 0$ and $2x + 2y + 2 = 0$ have unique solution ?
(a) $p = 1$
(b) $p = 2$
(c) $p \neq 4$
(d) $p \neq 2$
Sol : www.cbse.site/ma/cm135

36. For what value of $k$, the pair of linear equations $kx - 4y = 3, \ 6x - 12y = 9$ has an infinite number of solutions ?
(a) $k = 2$
(b) $k \neq 2$
(c) $k \neq 3$
(d) $k = 4$
Sol : www.cbse.site/ma/cm136
37. For what value of \( k \), the system of equations \( kx + 3y = 1, \ 12x + ky = 2 \) has no solution.
   (a) \( k = -6 \)
   (b) \( k \neq -6 \)
   (c) \( k = 4 \)
   (d) \( k = -4 \)
   Sol : www.cbse.site/ma/cm137

38. What are the values of \( x \) and \( y \) for the following pair of linear equations?
   \[
   3x + 2y - 7 = 0 \\
   4x + y - 6 = 0
   \]
   (a) 1 and 2
   (b) 2 and 2
   (c) 1 and 1
   (d) -1 and -1
   Sol : www.cbse.site/ma/cm138

39. In the figure given below, \( ABCD \) is a rectangle. The values of \( x \) and \( y \) will be
   \[
   \begin{array}{c}
   D \quad x+y \quad C \\
   x-y \quad 16 \quad A \\
   22 \quad B
   \end{array}
   \]
   (a) 3 and 19
   (b) 19 and 3
   (c) 4 and 18
   (d) 18 and 4
   Sol : www.cbse.site/ma/cm139

40. What are the values of \( x \) and \( y \) for the following pair of linear equations?
   \[
   99x + 101y = 499 \text{ and } 101x + 99y = 501
   \]
   (a) 3 and 6
   (b) 3 and 2
   (c) 2 and 3
   (d) 6 and 3
   Sol : www.cbse.site/ma/cm140

41. What are the values of \( x \) and \( y \) for the following system of linear equations?
   \[
   2x - y = 2 \\
   x + 3y = 15
   \]
   (a) 4 and 5
   (b) 3 and 4
   (c) 5 and 4
   (d) 4 and 4
   Sol : www.cbse.site/ma/cm141

42. Select the value of \( k \) for which the pair of linear equations \( kx + y = d \) and \( x + ky = 1 \) have infinitely many solutions.
   (a) 1
   (b) 2
   (c) 3
   (d) 4
   Sol : www.cbse.site/ma/cm142

43. What are the values of \( x \) and \( y \) for the following system of equations?
   \[
   \frac{21}{x} + \frac{47}{y} = 110, \ \frac{47}{x} + \frac{21}{y} = 162, \ x, \ y \neq 0
   \]
   (a) \( \frac{1}{x} \) and \( \frac{1}{y} \)
   (b) \( \frac{1}{x} \) and 1
   (c) \( \frac{1}{x} \) and \( \frac{1}{y} \)
   (d) \( \frac{1}{x} \) and 1
   Sol : www.cbse.site/ma/cm143

44. A fraction becomes \( \frac{1}{4} \) when 2 is subtracted from the numerator and it becomes \( \frac{1}{3} \) when 1 is subtracted from the denominator. The fraction will be
   (a) \( \frac{1}{x} \)
   (b) \( \frac{1}{x} \)
   (c) \( \frac{1}{x} \)
   (d) \( \frac{1}{x} \)
   Sol : www.cbse.site/ma/cm144

45. In the figure, \( ABCDE \) is a pentagon with \( BE \parallel CD \) and \( BC \parallel DE \). \( BC \) is perpendicular to \( CD \). \( AB = 5 \text{ cm}, \ AE = 5 \text{ cm}, \ BE = 7 \text{ cm}, \ BC = x - y \) and \( CD = x + y \). If the perimeter of \( ABCDE \) is 27...
cm. The value of $x$ and $y$, will be

(a) 3 and 2
(b) 2 and 3
(c) 1 and 6
(d) 6 and 1

Sol : www.cbse.site/ma/cm145

46. Half the perimeter of a rectangular garden, whose length is 4 m more then its width, is 36 m. The dimensions of garden will be
(a) 20 m by 16 m
(b) 36 m by 10 m
(c) 16 m by 30 m
(d) 20 m by 16 m

Sol : www.cbse.site/ma/cm146

47. For what value of $p$ will the following system of equations have no solution?

\[
(2p - 1)x + (p - 1)y = 2p + 1; y + 3x - 1 = 0
\]

(a) $p = 2$
(b) $p \neq 2$
(c) $p = 4$
(d) $p \neq 4$

Sol : www.cbse.site/ma/cm147

48. For what value of $k$ the following pair of equations has no solution:

\[
x + 2y = 3, (k - 1)x + (k + 1)y = (k + 2).
\]

(a) $k = 3$
(b) $k \neq 3$
(c) $k = 4$
(d) $k \neq 4$

Sol : www.cbse.site/ma/cm148

49. Sum of the ages of a father and the son is 40 years. If father’s age is three times that of his son, then what is father age?

(a) 22 years
(b) 28 years
(c) 30 years
(d) 24 years

Sol : www.cbse.site/ma/cm149

50. What are the values of $x$ and $y$ for the following system of equation?

\[
\frac{x}{2} + \frac{2y}{3} = -1
\]
\[
x - \frac{y}{3} = 3
\]

(a) $-3$ and 2
(b) 2 and $-3$
(c) 1 and 4
(d) 4 and 1

Sol : www.cbse.site/ma/cm150

51. What are the values of $x$ and $y$ for the following system of equation?

\[
8x + 5y = 9
\]
\[
3x + 2y = 4
\]

(a) 2 and $-5$
(b) $-5$ and 2
(c) $-2$ and 5
(d) 5 and $-2$

Sol : www.cbse.site/ma/cm151

Direction For Question : (52-53)

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

52. How long would it take for one boy to do it?

(a) 45 days
(b) 60 days
(c) 15 days
(d) 25 days

Sol : www.cbse.site/ma/cm152
53. How long would it take for one man to do it ?
   (a) 13 days
   (b) 14 days
   (c) 16 days
   (d) 15 days

   Sol : www.cbse.site/ma/cm152

54. In an election contested between $A$ and $B$, $A$ obtained votes equal to twice the no. of persons on
the electoral roll who did not cast their votes and this later number was equal to twice his majority
over $B$. If there were 1,8000 persons on the electoral roll. How many votes for $B$.
   (a) 2000
   (b) 8000
   (c) 6000
   (d) 1000

   Sol : www.cbse.site/ma/cm153

55. In the figure below $ABCDE$ is a pentagon with $BE \parallel CD$ and $BC \parallel DE$. $BC$ is perpendicular to $DC$.
If the perimeter of $ABCDE$ is 21 cm, what is the value of $x$?

   Direction For Question : (58-60)
   Solve the following pair of equations for $x$ and $y$ :
   
   \[ 4x + \frac{6}{y} = 15 \]
   \[ 6x - \frac{8}{y} = 14 \]

   and also find the value of $p$ such that $y = px - 2$.

56. What is the value of $x$?
   (a) $\frac{1}{3}$
   (b) $\frac{1}{2}$
   (c) $\frac{1}{4}$
   (d) $\frac{1}{6}$

   Sol : www.cbse.site/ma/cm155

57. What is the value of $y$?
   (a) $\frac{1}{3}$
   (b) $\frac{1}{2}$
   (c) $\frac{2}{3}$
   (d) $\frac{1}{4}$

   Sol : www.cbse.site/ma/cm155

Direction For Question : (58-60)
Solve the following pair of equations for $x$ and $y$ :

58. What is the value of $x$?
   (a) 3
   (b) 4
   (c) 5
   (d) 6

   Sol : www.cbse.site/ma/cm156

59. What is the value of $y$?
   (a) 1
   (b) 2
   (c) 3
   (d) 4

   Sol : www.cbse.site/ma/cm156

60. What is the value of $p$ such that $y = px - 2$?
   (a) $\frac{1}{3}$
   (b) $\frac{2}{3}$
   (c) $\frac{1}{4}$
   (d) $\frac{1}{4}$
61. A chemist has one solution which is 50% acid and a second which is 25% acid. How much of each should be mixed to make 10 litre of 40% acid solution.
(a) 6 litre of 50% acid and 4 litre of 25% acid
(b) 4 litre of 50% acid and 6 litre of 25% acid
(c) 3 litre of 50% acid and 6 litre of 25% acid
(d) 2 litre of 50% acid and 3 litre of 25% acid

Direction For Question: (62-63)
A man can row a boat downstream 20 km in 2 hours and upstream 4 km in 2 hours.

62. What is his speed of rowing in still water?
(a) 2 km/hr
(b) 3 km/hr
(c) 6 km/hr
(d) 8 km/hr

Sol : www.cbse.site/ma/cm158

63. What is the speed of the stream?
(a) 1 km/hr
(b) 3 km/hr
(c) 4 km/hr
(d) 0.5 km/hr

Sol : www.cbse.site/ma/cm158

Direction For Question: (64-65)
It can take 12 hours to fill a swimming pool using two pipes. If the pipe of larger diameter is used for four hours and the pipe of smaller diameter for 9 hours, only half of the pool can be filled.

64. How long would it take for larger pipe to fill the pool separately?
(a) 10 hours
(b) 20 hours
(c) 30 hours
(d) 35 hours

Sol : www.cbse.site/ma/cm159

65. How long would it take for smaller pipe to fill the pool separately?
(a) 10 hours
(b) 20 hours
(c) 30 hours
(d) 35 hours

Sol : www.cbse.site/ma/cm159

Direction For Question: (66-67)
The total cost of a certain length of a piece of cloth is ₹200. If the piece was 5 m longer and each metre of cloth costs ₹2 less, the cost of the piece would have remained unchanged.

66. How long is the piece?
(a) 18 m
(b) 20 m
(c) 22 m
(d) 15 m

Sol : www.cbse.site/ma/cm160

67. What is its original rate per metre?
(a) ₹12
(b) ₹15
(c) ₹10
(d) ₹16

Sol : www.cbse.site/ma/cm160

68. In Figure, ABCD is a rectangle. The values of x and y will be

- (a) 20 cm
- (b) 24 cm
- (c) 22 cm
- (d) 18 cm

Sol : www.cbse.site/ma/cm161
69. 4 chairs and 3 tables cost Rs 2100 and 5 chairs and 2 tables cost Rs 1750. What is the cost of one chair and one table separately?
   (a) Rs 150 and Rs 500
   (b) Rs 500 and Rs 150
   (c) Rs 250 and Rs 400
   (d) Rs 400 and Rs 250
   Sol : www.cbse.site/ma/cm162

Direction For Question : (70-71)
Solve the following pair of equations :
\[3x - 5y - 4 = 0 \text{ and } 9x = 2y + 7\]

70. What is the value of \(y\)
   (a) \(-\frac{2}{7}\)
   (b) \(-\frac{3}{7}\)
   (c) \(\frac{2}{7}\)
   (d) \(\frac{9}{17}\)
   Sol : www.cbse.site/ma/cm163

71. What is the value of \(x\)
   (a) \(-\frac{2}{7}\)
   (b) \(-\frac{3}{7}\)
   (c) \(\frac{2}{7}\)
   (d) \(\frac{9}{17}\)
   Sol : www.cbse.site/ma/cm163

Direction For Question : (72-73)
A train covered a certain distance at a uniform speed. If the train would have been 10 km/hr scheduled time. And, if the train were slower by 10 km/hr, it would have taken 3 hr more than the scheduled time.

72. What is the actual speed of train?
   (a) 50 kmph
   (b) 60 kmph
   (c) 40 kmph
   (d) 30 kmph
   Sol : www.cbse.site/ma/cm164

73. What is the distance covered by the train?
   (a) 200 km

Direction For Question : (74-75)
The ratio of incomes of Ram and Shyam is 11:7 and the ratio of their expenditures is 9:5. Each of them manages to save Rs 400 per month.

74. What is monthly incomes of Ram?
   (a) Rs 2200
   (b) Rs 1400
   (c) Rs 1100
   (d) Rs 700
   Sol : www.cbse.site/ma/cm165

75. What is monthly income of Shyam?
   (a) Rs 2200
   (b) Rs 1400
   (c) Rs 1100
   (d) Rs 700
   Sol : www.cbse.site/ma/cm165

Direction For Question : (76-77)
Two point \(A\) and \(B\) are 150 km apart on a highway. Two cars start from \(A\) and \(B\) at the same time. If they move in the same direction they meet in 15 hours. But if they move in the opposite direction, they meet in 1 hours.

76. Speed of the car starting form \(A\) is
   (a) 50 kmph
   (b) 60 kmph
   (c) 40 kmph
   (d) 80 kmph
   Sol : www.cbse.site/ma/cm166

77. Speed of the car starting form \(B\) is
   (a) 50 kmph
   (b) 30 kmph
   (c) 90 kmph
(d) 70 kmph
Sol : www.cbse.site/ma/cm166

78. If 2 is subtracted from the numerator and 1 is added to the denominator, a fraction becomes $\frac{1}{7}$, but when 4 is added to the numerator and 3 is subtracted from the denominator, it becomes $\frac{4}{7}$. The fraction will be
(a) $\frac{2}{7}$
(b) $\frac{5}{11}$
(c) $\frac{4}{7}$
(d) $\frac{5}{11}$
Sol : www.cbse.site/ma/cm167

Direction For Question : (79-80)

If a bag containing red and white balls, half the number of white balls is equal to one-third the number of red balls. Thrice the total number of balls exceeds seven times the number of white balls by 6.

79. How many balls of white colour does the bag contain?
   (a) 10
   (b) 12
   (c) 14
   (d) 18
   Sol : www.cbse.site/ma/cm168

80. How many balls of red colour does the bag contain?
   (a) 10
   (b) 12
   (c) 14
   (d) 18
   Sol : www.cbse.site/ma/cm168

81. A two digit number is obtained by either multiplying the sum of digits by 8 and then subtracting 5 or by multiplying the difference of digits by 16 and adding 3. The number will be
   (a) 83
   (b) 98
   (c) 77
   (d) 53
   Sol : www.cbse.site/ma/cm169

82. The area of a rectangle gets reduced by 9 square units, if its length is reduced by 5 units and the breadth is increased by 3 units. The area is increased by 67 square units if length is increased by 3 units and breadth is increased by 2 units. The perimeter of the rectangle will be
   (a) 52 units
   (b) 58 units
   (c) 46 units
   (d) 48 units
   Sol : www.cbse.site/ma/cm170

83. What is the value of x?
   (a) 1
   (b) 2
   (c) 3
   (d) 4
   Sol : www.cbse.site/ma/cm171

84. What is the value of y?
   (a) 1
   (b) 2
   (c) 3
   (d) 4
   Sol : www.cbse.site/ma/cm171

85. The students of a class are made to stand in rows. If 3 students are extra in a row, there would be 1 row less. If 3 students are less in a row, there would be 2 rows more. The number of students in the class will be
   (a) 24
   (b) 36
   (c) 32
   (d) 28
   Sol : www.cbse.site/ma/cm172
**Direction For Question : (86-87)**

The ages of two friends Ani and Biju differ by 3 years. Ani’s father Dharam is twice as old as ani and Biju is twice as old as his sister Cathy. The ages of Cathy and Dharam differ by 30 year. Find the ages of Ani and Biju.

86. The age of Ani is 
   (a) 16 year  
   (b) 19 year  
   (c) 20 years  
   (d) 24 years  
   **Sol :** www.cbse.site/ma/cm173

87. The age of Biju is 
   (a) 16 year  
   (b) 19 year  
   (c) 20 year  
   (d) 24 years  
   **Sol :** www.cbse.site/ma/cm173

88. 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.” What is the amount of their (respective) capital ?
   (a) Rs 80 and Rs 190  
   (b) Rs 20 and Rs 160  
   (c) Rs 40 and Rs 170  
   (d) Rs 100 and Rs 200  
   **Sol :** www.cbse.site/ma/cm174

89. A fraction become \( \frac{a}{b} \) if 2 is added to both numerator and denominator. If 3 is added to both numerator and denominator it becomes \( \frac{c}{d} \). The fraction will be 
   (a) \( \frac{a}{b} \)  
   (b) \( \frac{c}{d} \)  
   (c) \( \frac{c}{d} \)  
   (d) \( \frac{a}{b} \)  
   **Sol :** www.cbse.site/ma/cm175

**Direction For Question : (90-91)**

A motor boat can travel 30 km upstream and 28 km downstream in 7 hours. It can travel 21 km upstream and return in 5 hours.

90. The speed of the boat in still water will be 
   (a) 10 km/hr  
   (b) 4 km/hr  
   (c) 12 km/hr  
   (d) 16 km/hr  
   **Sol :** www.cbse.site/ma/cm176

91. The speed of the stream will be 
   (a) 10 km/hr  
   (b) 4 km/hr  
   (c) 12 km/hr  
   (d) 16 km/hr  
   **Sol :** www.cbse.site/ma/cm176

**Direction For Question : (92-93)**

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.

92. The speed of the boat in still water will be 
   (a) 10 km/hr  
   (b) 8 km/hr  
   (c) 12 km/hr  
   (d) 16 km/hr  
   **Sol :** www.cbse.site/ma/cm177

93. The speed of the stream will be 
   (a) 2 km/hr  
   (b) 4 km/hr  
   (c) 3 km/hr  
   (d) 1 km/hr  
   **Sol :** www.cbse.site/ma/cm177

**Direction For Question : (94-95)**

For what values of \( a \) and \( b \) does the following pair of linear equations have infinite number of solution ?

\[
2x + 3y = 7, a(x + y) - b(x - y) = 3a + b - 2
\]

94. The value of \( a \) will be 
   (a) 3
95. The value of $b$ will be
(a) 1
(b) 3
(c) 2
(d) 4
Sol: www.cbse.site/ma/cm178

Direction For Question: (96-97)
At a certain time in a deer, the number of heads and the number of legs of deer and human visitors were counted and it was found that there were 39 heads and 132 legs.

96. What is the number of deer visitors in the park?
(a) 12
(b) 27
(c) 16
(d) 38
Sol: www.cbse.site/ma/cm179

97. What is the number of human visitors in the park?
(a) 12
(b) 27
(c) 16
(d) 38
Sol: www.cbse.site/ma/cm179

98. The length of the sides of a triangle are $2x + \frac{5}{7}$, $\frac{3x}{5} + y + \frac{1}{2}$ and $\frac{2}{3}x + 2y + \frac{3}{2}$. If the triangle is equilateral, its perimeter is
(a) 14.5 m
(b) 29 m
(c) 19.5 m
(d) 39 m
Sol: www.cbse.site/ma/cm180

99. When 6 boys were admitted and 6 girls left, the percentage of boys increased from 60% to 75%. What is the original no. of boys and girls in the class?
(a) 24 and 16
(b) 16 and 24
(c) 12 and 16
(d) 16 and 12
Sol: www.cbse.site/ma/cm181

Direction For Question: (100-101)
A cyclist, after riding a certain distance, stopped for half an hour to repair his bicycle, after which he completes the whole journey of 30 km at half speed in 5 hours. If the breakdown had occurred 10 km farther off, he would have done the whole journey in 4 hours. Find where the breakdown occurred and his original speed.

100. What was the original speed?
(a) 10 km
(b) 12 km
(c) 8 km
(d) 7 km
Sol: www.cbse.site/ma/cm182

101. Where the breakdown occurred?
(a) at 10 km
(b) at 12 km
(c) at 8 km
(d) at 7 km
Sol: www.cbse.site/ma/cm182

Direction For Question: (102-103)
The population of a village is 5000. If in a year, the number of males were to increase by 5% and that of a female by 3% annually, the population would grow to 5202 at the end of the year. Find the number of males and females in the village.

102. The number of male in village is
(a) 2600
(b) 2400
(c) 2200
(d) 2800
Sol: www.cbse.site/ma/cm180
103. The number of female in village is
(a) 2600
(b) 2400
(c) 2200
(d) 2800
Sol : www.cbse.site/ma/cm183

104. How many lawns Nitin must service each month to break even ?
(a) 100
(b) 120
(c) 140
(d) 160
Sol : www.cbse.site/ma/cm184

105. What is the revenue required to break even.
(a) ₹ 23000
(b) ₹ 11500
(c) ₹ 9800
(d) ₹ 17690
Sol : www.cbse.site/ma/cm184

106. What is the revenue if they get 90 services ?
(a) ₹ 995
(b) ₹ 610
(c) ₹ 2030
(d) ₹ 1015
Sol : www.cbse.site/ma/cm184

107. How many units must be made and sold each month to break even ?
(a) 1050
(b) 700
(c) 350
(d) 230
Sol : www.cbse.site/ma/cm185

108. What is the revenue required to break even.
(a) ₹ 198400
(b) ₹ 126800
(c) ₹ 321600
109. A play is a work of drama, usually consisting mostly of dialogue between characters and intended for theatrical performance rather than just reading. Comedies are plays which are designed to be humorous. Comedies are often filled with witty remarks, unusual characters, and strange circumstances. Certain comedies are geared toward different age groups.

At a recent production of a comedy drama, the Ravindra Rangmanch Theater brought in a total of Rs 304950 in revenue. If adult tickets were Rs 90 and children’s tickets were Rs 65, how many tickets of each type were sold if 3800 tickets in all were sold?
(a) 1314 adult tickets and 1564 child tickets
(b) 1482 adult tickets and 2318 child tickets
(c) 2318 adult tickets and 1482 child tickets
(d) 1564 adult tickets and 1314 child tickets

110. How much was loaned to engineering student?
(a) ₹ 75000
(b) ₹ 35000
(c) ₹ 85000
(d) ₹ 65000

111. How much was loaned to science student?
(a) ₹ 75000
(b) ₹ 35000
(c) ₹ 85000
(d) ₹ 65000

Direction For Question : (110-111)
Alumni association of NIT Kurushkstra donated Rs 100,000 to his alma mater. The college used the funds to make a loan to a science student at 7% interest and a loan to an engineering student at 6% interest. That year the college earned Rs 6350 in interest.

112. How much was loaned to engineering student?
(a) ₹ 75000
(b) ₹ 35000
(c) ₹ 85000
(d) ₹ 65000

113. How much was loaned to science student?
(a) ₹ 75000
(b) ₹ 35000
(c) ₹ 85000
(d) ₹ 65000

Direction For Question : (112-113)
A moving walkway, also known as an autowalk, is a slow-moving conveyor mechanism that transports people across a horizontal or inclined plane over a short to medium distance. Moving walkways can be used by standing or walking on them. They are often
installed in pairs, one for each direction.

As part of an algebra field trip, Jenish takes his class to the airport to use their moving walkways for a demonstration. The class measures the longest walkway, which turns out to be 256 ft long. Using a stop watch, Jenish shows it takes him just 32 sec to complete the walk going in the same direction as the walkway. Walking in a direction opposite the walkway, it takes him 320 sec (10 times as long!). The next day in class, Jenish hands out a two question quiz:

112. What is my (Jenish’s) normal walking speed?
   (a) 3.6 ft/sec
   (b) 4.4 ft/sec
   (c) 2.4 ft/sec
   (d) 2.2 ft/sec

   Sol : www.cbse.site/ma/cm188

113. What was the speed of the walkway in feet per second?
   (a) 3.6 ft/sec
   (b) 4.4 ft/sec
   (c) 2.4 ft/sec
   (d) 2.2 ft/sec

   Sol : www.cbse.site/ma/cm188

114. Shalvi wants to use milk and orange juice to increase the amount of calcium and vitamin A in her daily diet. An ounce of milk contains 38 milligrams of calcium and 56 micrograms of vitamin A. An ounce of orange juice contains 5 milligrams of calcium and 60 micrograms of vitamin A. How many ounces of milk and orange juice should she drink each day to provide exactly 550 milligrams of calcium and 1,200 micrograms of vitamin A?

   (a) 6.2 ounce of milk and 11.5 ounce of orange juices
   (b) 11.5 ounce of milk and 6.2 ounce of orange juices
   (c) 13.5 ounce of milk and 7.2 ounce of orange juices
   (d) 7.2 ounce of milk and 13.5 ounce of orange juices

   Sol : www.cbse.site/ma/cm189

115. Pathmeda village near Sanchore has Gopal Govardhan Gaushala, the largest Gaushala in India, spread over 200 acres. The gaushala takes care of more than 18,000 cattle.

   Cows of Pathmeda gaushala in an experiment are to be kept on a strict diet. Each cow is to receive, among other things, 20 grams of protein and 6 grams of fat.
The laboratory technician is able to purchase two food mixes of the following compositions:
Mix A has 10% protein and 6% fat,
Mix B has 20% protein and 2% fat.

How many grams of each mix should be used to obtain the right diet for a single cow?
(a) 80 grams Mix A and 60 grams Mix B
(b) 60 grams Mix A and 80 grams Mix B
(c) 70 grams Mix A and 50 grams Mix B
(d) 50 grams Mix A and 70 grams Mix B

Sol : www.cbse.site/ma/cm190

116. When you mix two or more substances with different levels of concentration, the final solution does not simply equate to the combined concentration levels of the original ingredients. It depends on the concentration of each solution.

Rahman works as a chemist in Biolab Pvt Ltd at Jaipur. He has two solutions of hydrochloric acid in stock: a 50% solution and an 80% solution. He wants to make 100 milliliters of a 68% solution? How much of each should be used to obtain 100 milliliters of a 68% solution?
(a) 60 ml of 50% solution and 40 ml of 80% solution.
(b) 40 ml of 50% solution and 60 ml of 80% solution.
(c) 70 ml of 50% solution and 70 ml of 80% solution.
(d) 30 ml of 50% solution and 70 ml of 80% solution.

Sol : www.cbse.site/ma/cm191

117. A jeweller has two bars of gold alloy in stock, one of 12 carats and the other of 18 carats (24 carat gold is pure gold, 12 carat is \( \frac{12}{24} \) pure, 18 carat gold is \( \frac{18}{24} \) pure, and so on). How many grams of each alloy must be mixed to obtain 10 grams of 14 carat gold?
(a) 6 \( \frac{2}{3} \) grams of 12 carat gold and 3 \( \frac{1}{3} \) grams of 18 carat gold
(b) 3 \( \frac{1}{3} \) grams of 12 carat gold and 6 \( \frac{2}{3} \) grams of 18 carat gold
(c) 7 \( \frac{2}{3} \) grams of 12 carat gold and 2 \( \frac{1}{3} \) grams of 18 carat gold
(d) 2 \( \frac{1}{3} \) grams of 12 carat gold and 7 \( \frac{2}{3} \) grams of 18 carat gold

Sol : www.cbse.site/ma/cm192

Direction For Question : (118-119)

It costs a small recording company Rs 176, 800 to prepare a compact disc. This is a one-time fixed cost that covers recording, package design, and so on. Variable costs, including such things as manufacturing, marketing, and royalties, are Rs 46 per CD.
118. If the CD is sold to music shops for Rs 80 each, how many must be sold for the company to break even?
(a) 7800  
(b) 2600  
(c) 3900  
(d) 5200  
Sol : www.cbse.site/ma/cm193

119. What is the break even revenue?
(a) ₹216000  
(b) ₹314000  
(c) ₹416000  
(d) ₹231000  
Sol : www.cbse.site/ma/cm193

120. Ridhima Electronics Pvt Ltd is main supplier for CASIO for electronics component. They manufactures keyboards and screens for graphing calculators at plants in Bangalore and Bhiwadi. The hourly production rates at each plant are given in the table. How many hours should each plant be operated to fill an order for exactly 4,000 keyboards and exactly 4,000 screens?

<table>
<thead>
<tr>
<th>Plant</th>
<th>Keyboards</th>
<th>Screens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangalore</td>
<td>40</td>
<td>32</td>
</tr>
<tr>
<td>Bhiwadi</td>
<td>20</td>
<td>32</td>
</tr>
</tbody>
</table>

(a) Bangalore plant should be operated for 50 hours and Bhiwadi plant should be operated for 75 hours.  
(b) Bangalore plant should be operated for 75 hours and Bhiwadi plant should be operated for 50 hours.  
(c) Bangalore plant should be operated for 80 hours and Bhiwadi plant should be operated for 45 hours.  
(d) Bangalore plant should be operated for 45 hours and Bhiwadi plant should be operated for 80 hours.  
Sol : www.cbse.site/ma/cm194

Direction For Question : (121-122)  
Orange trees thrive in warm, Mediterranean climates where there is no threat of frost. This full-sun plant produces the best fruit when provided with optimal moisture, light and nutrition, in the form of fertilization. Orange trees require fertilization three times per year. You need to increase fertilizer amounts as the tree ages and becomes established. Complete nutrition is essential for a healthy tree.

A fruit grower can use two types of fertilizer in an orange grove, brand A and brand B. Each bag of brand A contains 8 pounds of nitrogen and 4 pounds of phosphoric acid. Each bag of brand B contains 7 pounds of nitrogen and 7 pounds of phosphoric acid. Tests indicate that the grove needs 720 pounds of nitrogen and 500 pounds of phosphoric acid.

121. How many bags of brand A should be used to provide the required amounts of nitrogen and phosphoric acid?
(a) 35 bag  
(b) 55 bag
122. How many bags of brand B should be used to provide the required amounts of nitrogen and phosphoric acid?
(a) 35 bag
(b) 55 bag
(c) 28 bag
(d) 40 bag
Sol : www.cbse.site/ma/cm195

124. How high is the building?
(a) 274 feet
(b) 174 feet
(c) 228 feet
(d) 196 feet
Sol : www.cbse.site/ma/cm196

125. How long does the object fall?
(a) 3.5 sec
(b) 7 sec
(c) 2.5 sec
(d) 5 sec
Sol : www.cbse.site/ma/cm196

Direction For Question : (123-125)
To prove that objects of different weights fall at the same rate, Galileo dropped two objects with different weights from the Leaning Tower of Pisa in Italy. The objects hit the ground at the same time.

An object dropped off the top of Leaning Tower of Pisa falls vertically with constant acceleration. If $s$ is the distance of the object above the ground (in feet) $t$ seconds after its release, then $s$ and $t$ are related by an equation of the form $s = at + bt^2$ where $a$ and $b$ are constants. Suppose the object is 180 feet above the ground 1 second after its release and 132 feet above the ground 2 seconds after its release.

123. What are the values of constants $a$ and $b$?
(a) –20 and 174
(b) –16 and 196
126. How long did each wave travel?
(a) Primary wave travelled 24 second and secondary wave travelled 40 second.
(b) Primary wave travelled 40 second and secondary wave travelled 24 second.
(c) Primary wave travelled 20 second and secondary wave travelled 24 second.
(d) Primary wave travelled 24 second and secondary wave travelled 20 second.
Sol: www.cbse.site/ma/cm197

127. How far was the earthquake from the station?
(a) 238 mile
(b) 224 mile
(c) 120 mile
(d) 240 mile
Sol: www.cbse.site/ma/cm197

Direction For Question : (128-129)

Jyoti Kumari is an Indian student from Sirhulli in the rural Darbhanga district of Bihar. She came to notice after she bicycled some 1,200 km with her injured father to reach their home village during COVID-19 lockdowns in India. This act of bravery was praised by the Senior Advisor to the President of the United States, Ivanka Trump, and Prime Minister Narendra Modi. She was given a national award, and a Bollywood film was proposed to record her story.

Jyoti travelled 90 km every day to reach her home town in Harbin. One day, when she started, after riding a certain distance, she stopped for some time to repair his bicycle. After which she completes the whole journey of 90 km at half speed in 12 hours. If the breakdown had occurred 10 km farther off, she would have done the whole journey in 11 hours.

128. Where the breakdown occurred?
(a) 60 km
(b) 48 km
(c) 32 km
(d) 44 km
Sol: www.cbse.site/ma/cm198

129. What is her original speed?
(a) 10 km/hr
(b) 20 km/hr
(c) 12 km/hr
(d) 9 km/hr
Sol: www.cbse.site/ma/cm198

Direction For Question : (130-131)

Banasthali Vidyapith, is a fully residential women’s university offering courses from primary to Ph.D. level. It offers a number of UG, PG, and Doctoral level Programs under various Departments. Admission to the same is done on the basis of merit scored in qualifying examination, however, for some courses, an aptitude test is also conducted at the university level.

Swati is doing MSc. in biotechnology from Banasthali Vidyapith and lives in university hostel. A part of monthly hostel charge is fixed and the remaining depends on the number of days one has taken food in the mess. When Swati takes food for 20 days, she has to pay Rs. 3,000 as hostel charges whereas Mansi who takes food for 25 days Rs. 3,500 as hostel charges.
130. What are the fixed charges of hostel?
(a) ₹ 1200
(b) ₹ 1000
(c) ₹ 1400
(d) ₹ 900
Sol: www.cbse.site/ma/cm199

131. What is the cost of food per day?
(a) ₹ 100
(b) ₹ 120
(c) ₹ 115
(d) ₹ 110
Sol: www.cbse.site/ma/cm199

Direction For Question: (132-133)
Uniform motion with current:

\[(R + C) t = d\]  
With the current
\[(R - C) t = d\]  
Against the current

The formula shown can be used to solve uniform motion problems involving a current, where \(d\) represents distance travelled, \(R\) is the rate of the object with no current, \(C\) is the speed of the current, and \(t\) is the time. Vibhur rows 9 km up river (against the current) in 3 hr. It only took him 1 hr to row 5 km downstream (with the current).

132. How fast can he row in still water?
(a) 1 km/h
(b) 2 km/h
(c) 3 km/h
(d) 4 km/h
Sol: www.cbse.site/ma/cm200

133. How fast was the current?
(a) 1 km/h
(b) 2 km/h
(c) 3 km/h
(d) 4 km/h
Sol: www.cbse.site/ma/cm200

Direction For Question: (134-135)

On a recent camping trip, it took Mohinder and Aslam 2 hr to row 4 mi upstream from the drop in point to the camp site. After a leisurely weekend of camping, fishing, and relaxation, they rowed back downstream to the drop in point in just 30 min. Use this information to find

134. What is the speed of the current.
(a) 5 mph
(b) 3 mph
(c) 6 mph
(d) 4 mph
Sol: www.cbse.site/ma/cm201

135. What is the rowing speed of Mohinder and Aslam in still water.
(a) 5 mph
(b) 3 mph
(c) 6 mph
(d) 4 mph
Sol: www.cbse.site/ma/cm201

Direction For Question: (136-137)

As India’s first domestic cruise liner, Angriya has made many voyages on the Mumbai-Goa sea route, along the pristine Konkan Coast. It has given India and Indians a sense of pride and happiness, while introducing the travelers to coral diversity and royal sea forts along the way.
Last year we enjoyed our summer vacation at Angariya cruise. From Mumbai to the Goa, the trip took 70 hr. After a few days of fun in the sun, the ship leaves for Mumbai, with the return trip taking 82 hr.

136. What is the cruising speed of the ship.
   (a) 15 kmph
   (b) 19 kmph
   (c) 25 kmph
   (d) 20 kmph
   Sol : www.cbse.site/ma/cm202

137. What is the speed of the current.
   (a) 1.5 kmph
   (b) 3 kmph
   (c) 2.5 kmph
   (d) 2 kmph
   Sol : www.cbse.site/ma/cm202

138. The point during a flight at which an aircraft is no longer capable of returning to the airfield from which it took off due to fuel considerations. Beyond this point the aircraft must proceed to some other destination.

A plane carries enough fuel for 20 hours of flight at an airspeed of 150 miles per hour. How far can it fly into a 30 mph headwind and still have enough fuel to return to its starting point?
   (a) 1330 miles
   (b) 1220 miles
   (c) 1550 miles
   (d) 1440 miles
   Sol : www.cbse.site/ma/cm203

Direction For Question : (139-140)

When it was first constructed in 1889, the Eiffel Tower in Paris, France, was the tallest structure in the world. In 1975, the CN Tower in Toronto, Canada, became the world’s tallest structure. The CN Tower is 153 ft less than twice the height of the Eiffel Tower, and the sum of their heights is 2799 ft.

139. How tall is CN tower?
   (a) 2168 ft
   (b) 984 ft
   (c) 1815 ft
   (d) 1214 ft
   Sol : www.cbse.site/ma/cm204

140. How tall is Eiffel tower?
   (a) 2168 ft
   (b) 984 ft
   (c) 1815 ft
   (d) 1214 ft
   Sol : www.cbse.site/ma/cm204

141. You are the manager of a shoe store. On Sunday
morning you are going over the receipts for the previous week’s sales. A total of 320 pairs of cross-training shoes were sold. One style sold for Rs 1135 and the other sold for Rs 1495. The total receipts were Rs 420,480. The cash register that was supposed to keep track of the number of each type of shoe sold malfunctioned. Can you recover the information? If so, how many of each type were sold?

(a) 175 shoes of style one and 145 pairs shoes of style two
(b) 145 shoes of style one and 175 pairs shoes of style two
(c) 155 shoes of style one and 165 pairs shoes of style two
(d) 165 shoes of style one and 155 pairs shoes of style two

Sol : www.cbse.site/ma/cm205

142. The grocery store we use does not mark prices on its goods. My wife went to this store, purchased three 1-kg packages of almond and two 500-gram packages cashew, and paid a total of Rs 1345. Not knowing that she went to the store, I also went to the same store, purchased two 1-kg packages of almond and three 500-gram packages cashew, and paid a total of Rs 1145. Now we want to return two 1-kg packages of almond and two 500-gram packages cashew. How much will be refunded?

(a) ₹ 1234
(b) ₹ 996
(c) ₹ 1968
(d) ₹ 1486

Sol : www.cbse.site/ma/cm206

Direction For Question : (143-144)

Planning for retirement starts with thinking about your retirement goals and how long you have to meet them. Then you need to look at the types of retirement accounts that can help you raise the money to fund your future. As you save that money, you have to invest it to enable it to grow.

A recently retired couple needs Rs 120,000 per year to supplement their Social Security. They have Rs 1,500,000 to invest to obtain this income. They have decided to invest in two options: AA bonds yielding 10% per annum and a fixed deposit yielding 5%.

143. How much should be invested in AA bond to realize
exactly Rs 120,000?
(a) 900 thousand
(b) 600 thousand
(c) 500 thousand
(d) 400 thousand

Sol : www.cbse.site/ma/cm207

144. How much should be invested in fixed deposit to realize exactly Rs 120,000?
(a) 900 thousand
(b) 600 thousand
(c) 500 thousand
(d) 400 thousand

Sol : www.cbse.site/ma/cm207

145. If, after 2 years, the couple requires Rs 140,000 per year in income, how should they reallocate their investment to achieve the new amount?
(a) 1100 thousand in AA bond and 400 thousand in fixed deposit
(b) 1200 thousand in AA bond and 300 thousand in fixed deposit
(c) 1300 thousand in AA bond and 200 thousand in fixed deposit
(d) 1000 thousand in AA bond and 600 thousand in fixed deposit

Sol : www.cbse.site/ma/cm207

Direction For Question : (146-147)
A wireless store owner takes presale orders for a new smartphone and tablet. He gets 340 preorders for the smartphone and 250 preorders for the tablet. The combined value of the preorders is Rs 27,050,000. The price of a smartphone and tablet together is Rs 96500

146. How much does smartphone cost?
(a) ₹ 28500
(b) ₹ 32500
(c) ₹ 57000
(d) ₹ 65000

Sol : www.cbse.site/ma/cm208

147. How much does tablet cost?
(a) ₹ 72000
(b) ₹ 64000
(c) ₹ 79000
(d) ₹ 68000

Sol : www.cbse.site/ma/cm208

148. In 2013 there was a total of 81 commercial and noncommercial orbital launches worldwide. In addition, the number of noncommercial orbital launches was twelve more than twice the number of commercial orbital launches. Determine the number of commercial and noncommercial orbital launches
in 2013.

(a) 58 commercial and 23 non-commercial
(b) 23 commercial and 58 non-commercial
(c) 21 commercial and 60 non-commercial
(d) 60 commercial and 21 non-commercial

Sol : www.cbse.site/ma/cm209

Direction For Question : (149–150)

Actual Number of Calories : University of Arkansas researchers discovered that we underestimate the number of calories in restaurant meals. The next time you eat out, take the number of calories you think you ate and double it. The researchers concluded that this number should be a more accurate estimate. The actual number of calories in one portion of hamburger and fries and two portions of pizza is 4240. The actual number of calories in two portions of hamburger and fries and one portion of pizza is 3980.

149. What are the actual number of calories in one portions of pizza.
(a) 1500
(b) 1240
(c) 1120
(d) 1640

Sol : www.cbse.site/ma/cm210

150. What are the actual number of calories in one portions of hamburger and fries.
(a) 1500
(b) 1240
(c) 1120
(d) 1640

Sol : www.cbse.site/ma/cm210

Direction For Question : (151–152)

At some point, it’s time to kick, or gently ease, kids off the parental gravy train. The circle graph shows the percentage of parents who think significant financial support should end at various milestones.

The difference in the percentage who would end this support after completing college and after completing high school is 6 %.

151. What is the percentage of parents who would end financial support after a child completes college.
(a) 33%
(b) 28%
(c) 32%
(d) 22%

Sol : www.cbse.site/ma/cm211

152. What is the percentage of parents who would end financial support after a child completes high school.
(a) 33%
(b) 28%
(c) 32%
(d) 22%
Masks are an additional step to help prevent people from getting and spreading COVID-19. They provide a barrier that keeps respiratory droplets from spreading. Wear a mask and take every day preventive actions in public settings.

Due to ongoing Corona virus outbreak, Wellness Medical store has started selling masks of decent quality. The store is selling two types of masks currently type A and type B.

The cost of type A mask is Rs. 15 and of type B mask is Rs. 20. In the month of April, 2020, the store sold 100 masks for total sales of Rs. 1650.

153. How many masks of each type were sold in the month of April?
(a) 40 masks of type A, and 60 masks of type B
(b) 60 masks of type A, and 40 masks of type B
(c) 70 masks of type A, and 30 masks of type B
(d) 30 masks of type A, and 70 masks of type B

154. If the store had sold 50 masks of each type, what would be its sales in the month of April?
(a) ₹ 550
(b) ₹ 560

155. Due to great demand and short supply, the store has increased the price of each type by Rs. 5 from May 1, 2020. In the month of May, 2020, the store sold 310 masks for total sales of Rs. 6875. How many masks of each type were sold in the month of May?
(a) 175 masks of type A, and 135 masks of type B
(b) 200 masks of type A, and 110 masks of type B
(c) 110 masks of type A, and 200 masks of type B
(d) 135 masks of type A, and 175 masks of type B

156. What percent of masks of each type sale was increased in the month of May, compared with the sale of month April?
(a) 110% in type A and 180% in type B
(b) 180% in type A and 110% in type B
(c) 350% in type A and 150% in type B
(d) 150% in type A and 350% in type B

157. What extra profit did store earn by increasing price in May month.
(a) ₹ 1550
(b) ₹ 3100
(c) ₹ 1650
(d) ₹ 1825

An architect is a skilled professional who plans and designs buildings and generally plays a key role in their construction. Architects are highly trained in the art and science of building design. Since they bear responsibility for the safety of their buildings’ occupants, architects must be professionally licensed.
Varsha is a licensed architect and design very innovative house. She has made a house layout for her client which is given below. In the layout, the design and measurements has been made such that area of two bedrooms and kitchen together is 95 sq. m.

158. Which pair of linear equations does describe this situation?
   (a) $2x + y = 19$ and $x + y = 13$
   (b) $x + 2y = 19$ and $2x + y = 13$
   (c) $2x + y = 38$ and $x + y = 13$
   (d) $2x + y = 38$ and $2x + y = 13$

   Sol : www.cbse.site/ma/cm213

160. What is the area of bedroom 1?
   (a) 24 m²
   (b) 30 m²
   (c) 28 m²
   (d) 24 m²

   Sol : www.cbse.site/ma/cm213

161. What is the area of living room in the layout?
   (a) 54 m²
   (b) 48 m²
   (c) 75 m²
   (d) 24 m²

   Sol : www.cbse.site/ma/cm213

162. What is the cost of laying tiles in Kitchen at the rate of Rs. 50 per sq. m?
   (a) ₹ 1500
   (b) ₹ 2000
   (c) ₹ 1750
   (d) ₹ 3000

   Sol : www.cbse.site/ma/cm213

Direction For Question: (163-167)

Dipesh bought 3 notebooks and 2 pens for Rs. 80. His friend Ramesh said that price of each notebook could be Rs. 25. Then three notebooks would cost Rs.75, the two pens would cost Rs. 5 and each pen could be for Rs. 2.50. Another friend Amar felt that Rs. 2.50 for one pen was too little. It should be at least Rs. 16. Then the price of each notebook would also be Rs.16.
Aditya also bought the same types of notebooks and pens as Dipesh. He paid 110 for 4 notebooks and 3 pens.

163. Whether the estimation of Ramesh and Amar is applicable for Aditya?
(a) Ramesh’s estimation is wrong but Amar’s estimation is correct.
(b) Ramesh’s estimation is correct but Amar’s estimation is wrong.
(c) Both estimation are correct.
(d) Ramesh’s estimation is wrong but Amar’s estimation is also wrong.

Sol : www.cbse.site/ma/cm214

164. Let the cost of one notebook be \( x \) and that of pen be \( y \). Which of the following set describe the given problem?
(a) \( 2x + 3y = 80 \) and \( 3x + 4y = 110 \)
(b) \( 3x + 2y = 80 \) and \( 4x + 3y = 110 \)
(c) \( 2x + 3y = 80 \) and \( 4x + 3y = 110 \)
(d) \( 3x + 2y = 80 \) and \( 3x + 4y = 110 \)

Sol : www.cbse.site/ma/cm214

165. What is the exact cost of the notebook?
(a) ₹ 10
(b) ₹ 20
(c) ₹ 16
(d) ₹ 24

Sol : www.cbse.site/ma/cm214

166. What is the exact cost of the pen?
(a) ₹ 10
(b) ₹ 20
(c) ₹ 16
(d) ₹ 24

Sol : www.cbse.site/ma/cm214

167. What is the total cost if they purchase the same type of 15 notebooks and 12 pens.
(a) ₹ 410
(b) ₹ 200
(c) ₹ 420
(d) ₹ 240

Sol : www.cbse.site/ma/cm214

Direction For Question : (168-172)
Mr. RK Agrawal is owner of a famous amusement park in Delhi. The ticket charge for the park is Rs 150 for children and Rs 400 for adult.

Generally he does not go to park and it is managed by team of staff. One day Mr Agrawal decided to random check the park and went there. When he checked the cash counter, he found that 480 tickets were sold and Rs 134500 was collected.

168. Let the number of children visited be \( x \) and the number of adults visited be \( y \). Which of the following is the correct system of equations that model the problem?
(a) \( x + y = 480 \) and \( 3x + 8y = 2690 \)
(b) \( x + 2y = 480 \) and \( 3x + 4y = 2690 \)
(c) \( x + y = 480 \) and \( 3x + 4y = 2690 \)
(d) \( x + 2y = 480 \) and \( 3x + 8y = 2690 \)

Sol : www.cbse.site/ma/cm215

169. How many children visited the park?
(a) 250
170. How many adults visited the park?
(a) 250
(b) 500
(c) 230
(d) 460
Sol : www.cbse.site/ma/cm215

171. How much amount collected if 300 children and 350 adults visited the park?
(a) ₹ 225400
(b) ₹ 154000
(c) ₹ 112500
(d) ₹ 185000
Sol : www.cbse.site/ma/cm215

172. One day total visited children and adults together is 750 and the total amount collected is Rs 212500. What are the number of children and adults visited the park?
(a) (700, 800)
(b) (350, 400)
(c) (800, 700)
(d) (400, 350)
Sol : www.cbse.site/ma/cm215

Direction For Question : (173–177)

Jodhpur is also known for the rare breed of horses known as Marwari or Malani, which are only found here.

Last year we visited Jodhpur in a group of 25 friends. When we went Mehrangarh Fort we found following fare for ride:

<table>
<thead>
<tr>
<th>Ride</th>
<th>Normal Hours Fare</th>
<th>Peak Hours Fare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horse</td>
<td>Rs 50</td>
<td>3 Times</td>
</tr>
<tr>
<td>Elephant</td>
<td>Rs 100</td>
<td>2 Times</td>
</tr>
</tbody>
</table>

Some people choose to ride on horse and rest choose to ride on elephant.

173. First day we rode in normal hours and we paid Rs 1950 for ride. Let \( x \) be the number of horses hired and \( y \) be the number elephants hired. Which of the following is the correct system of equation that model the problem?
(a) \( 2x + y = 25 \) and \( 2x + y = 49 \)
(b) \( 2x + y = 25 \) and \( 2x + y = 39 \)
(c) \( x + y = 25 \) and \( x + 2y = 39 \)
(d) \( x + y = 25 \) and \( x + 2y = 49 \)
Sol : www.cbse.site/ma/cm216

174. How many horses were hired?
(a) 9
(b) 14
(c) 16
(d) 11
Sol : www.cbse.site/ma/cm216

175. How many elephant were hired?
(a) 9
(b) 14
(c) 16
(d) 11
Sol : www.cbse.site/ma/cm216

176. Next day we rode in peak hours, then how much
total fare was paid by our group?
(a) ₹ 2250
(b) ₹ 2650
(c) ₹ 4450
(d) ₹ 3250
Sol : www.cbse.site/ma/cm216

177. What was the increase in total fare because of peak hours ride ?
(a) ₹ 2500
(b) ₹ 2550
(c) ₹ 2200
(d) ₹ 1550
Sol : www.cbse.site/ma/cm216

178. How many field goals did he make ?
(a) 10 Goals
(b) 20 Goals
(c) 15 Goals
(d) 18 Goals
Sol : www.cbse.site/ma/cm217

179. How many free throws did he make?
(a) 10 Goals
(b) 20 Goals
(c) 15 Goals
(d) 18 Goals
Sol : www.cbse.site/ma/cm217

Direction For Question : (178–182)
Wilton Norman “Wilt” Chamberlain was an American basketball player, and played in the NBA during the 1960s. At 7 feet 1 inch, he was the tallest and heaviest player in the league for most of his career, and he was one of the most famous people in the game for many years. He is the first and only basketball player to score 100 points in an NBA game.

In the 1961–1962 NBA basketball season, Wilt Chamberlain of the Philadelphia Warriors made 30 baskets. Some of the baskets were free throws (worth 1 point each) and some were field goals (worth 2 points each). The number of field goals was 10 more than the number of free throws.

180. What was the total number of points scored?
(a) 50
(b) 80
(c) 60
(d) 45
Sol : www.cbse.site/ma/cm217

181. If Wilt Chamberlain played 5 games during this season, what was the average number of points per game?
(a) 5
(b) 8
(c) 10
(d) 4
Sol : www.cbse.site/ma/cm217

182. If Wilt Chamberlain played 10 games during this season, what was the average number of points per game?
(a) 6
(b) 8
(c) 4
(d) 5
Sol : www.cbse.site/ma/cm217
SELF TEST QUESTIONS

183. Given the linear equation \(3x + 4y = 9\). Select another linear equation in these two variables such that the geometrical representation of the pair so formed is coincident lines.
   (a) \(3x - 5y = 10\)
   (b) \(6x + 8y = 18\)
   (c) \(8x + 12y = 18\)
   (d) above all
   Sol : www.cbse.site/ma/cm221

184. What are the values of \(x\) and \(y\) for the following pair of linear equations?
   \[
   \begin{align*}
   x + 2y &= 2 \\
   x - 3y &= 7
   \end{align*}
   \]
   (a) 1 and 1
   (b) 4 and -1
   (c) -4 and 1
   (d) 2 and 2
   Sol : www.cbse.site/ma/cm222

185. For what value of \(k\), \(2x + 3y = 4\) and \((k + 2)x + 6y = 3k + 2\) will have infinitely many solutions?
   (a) \(k = 2\)
   (b) \(k = 3\)
   (c) \(k \neq 3\)
   (d) \(k = 4\)
   Sol : www.cbse.site/ma/cm223

186. Given the linear equation \(2x + 3y - 8 = 0\), select another linear equation in two variables such that the geometrical representation of the pair so formed is parallel lines.
   (a) \(5x + 2y - 9 = 0\)
   (b) \(6x + 9y + 7 = 0\)
   (c) \(4x + 6y - 16 = 0\)
   (d) above all
   Sol : www.cbse.site/ma/cm224

187. Given the linear equation \(2x + 3y - 8 = 0\), select another linear equation in two variables such that the geometrical representation of the pair so formed is intersecting lines.
   (a) \(5x + 2y - 9 = 0\)
   (b) \(6x + 9y + 7 = 0\)
   (c) \(4x + 6y - 16 = 0\)
   (d) above all
   Sol : www.cbse.site/ma/cm225

188. Given the linear equation \(2x + 3y - 8 = 0\), select another linear equation in two variables such that the geometrical representation of the pair so formed is coincident lines.
   (a) \(5x + 2y - 9 = 0\)
   (b) \(6x + 9y + 7 = 0\)
   (c) \(4x + 6y - 16 = 0\)
   (d) above all
   Sol : www.cbse.site/ma/cm226

189. What are the values of \(m\) and \(n\) so that the following system of linear equation have infinite number of solutions:
   \[
   \begin{align*}
   mx + y &= 213 \\
   nx + y &= 312
   \end{align*}
   \]
   (a) 4 and 17
   (b) 4 and 11
   (c) 5 and 11
   (d) 5 and 9
   Sol : www.cbse.site/ma/cm227

190. What are the values of \(\alpha\) and \(\beta\) for which the following pair of linear equations has infinite number of solutions:
   \[
   \begin{align*}
   2x + 3y &= 7 \\
   2\alpha x + (\alpha + \beta)y &= 28
   \end{align*}
   \]
   (a) 4 and 6
   (b) 4 and 8
   (c) 8 and 4
   (d) 8 and 6
   Sol : www.cbse.site/ma/cm228

Direction For Question : (191-192)
Solve the following pair of equations:
\[
\frac{2}{\sqrt{x}} + \frac{3}{\sqrt{y}} = 2 \quad \text{and} \quad \frac{4}{\sqrt{x}} - \frac{9}{\sqrt{y}} = -1
\]
191. What is the value of $x$
   (a) 2
   (b) 3
   (c) 4
   (d) 5
   Sol: www.cbse.site/ma/cm229

192. What is the value of $y$?
   (a) 5
   (b) 7
   (c) 9
   (d) 11
   Sol: www.cbse.site/ma/cm229

Direction For Question: (193-194)
Solve the following pair of equations:
$$xy + 23 = 0$$
$$3x - 5y + 1 = 0$$

193. What is the value of $x$?
   (a) $-1$
   (b) $-2$
   (c) $-3$
   (d) $-4$
   Sol: www.cbse.site/ma/cm230

194. What is the value of $y$?
   (a) $-1$
   (b) $-2$
   (c) $-3$
   (d) $-4$
   Sol: www.cbse.site/ma/cm230

195. Solve the following pair of equations:
   $x + y = 5$ and $2x - 3y = 4$
   What are the value of $x$ and $y$?
   (a) $x = \frac{5}{7}$ and $y = \frac{6}{7}$
   (b) $x = \frac{19}{7}$ and $y = \frac{6}{7}$
   (c) $x = \frac{5}{7}$ and $y = \frac{6}{7}$
   (d) $x = \frac{5}{7}$ and $y = \frac{10}{7}$
   Sol: www.cbse.site/ma/cm231

196. Solve the following pair of equations:
   $$3x + 4y = 10$$
   $$2x - 2y = 2$$
   What are the value of $x$ and $y$?
   (a) $x = 1$ and $y = 2$
   (b) $x = 2$ and $y = 1$
   (c) $x = 3$ and $y = 3$
   (d) $x = 2$ and $y = 2$
   Sol: www.cbse.site/ma/cm232

197. For what value of $k$, following pair of linear equations have infinitely many solutions:
   $$2x + 3y = 7$$
   $$(k + 1)x + (2k - 1)y = 4k + 1$$
   (a) $k = 5$
   (b) $k \neq 5$
   (c) $k = 10$
   (d) $k \neq 10$
   Sol: www.cbse.site/ma/cm233

198. Select the value of $c$ if the system of equations $cx + 3y + (3 - c) = 0$; $12x + cy - c = 0$ has infinitely many solutions?
   (a) 4
   (b) 5
   (c) 6
   (d) 7
   Sol: www.cbse.site/ma/cm234

199. A father’s age is three times the sum of the ages of his two children. After 5 years his age will be two times the sum of their ages. The present age of the father will be
   (a) 40
   (b) 45
   (c) 35
   (d) 65
   Sol: www.cbse.site/ma/cm235

Direction For Question: (200-201)
Two water taps together can fill a tank in $1\frac{3}{5}$ hours. The tap with longer diameter takes 2 hours less than the tap with smaller one to fill the tank separately.
200. What is the time in which smaller diameter tap can fill the tank separately?
(a) 2
(b) 3
(c) 4
(d) 5
Sol: www.cbse.site/ma/cm236

201. What is the time in which larger diameter tap can fill the tank separately?
(a) 2
(b) 3
(c) 4
(d) 5
Sol: www.cbse.site/ma/cm236

Direction For Question: (202-203)
A 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.

202. What is the speed of the stream?
(a) 8 km/hour
(b) 3 km/hour
(c) 1 km/hour
(d) 2 km/hour
Sol: www.cbse.site/ma/cm237

203. What is the speed of the boat in still water?
(a) 8 km/hour
(b) 3 km/hour
(c) 1 km/hour
(d) 2 km/hour
Sol: www.cbse.site/ma/cm237

204. Sumit is 3 times as old as his son. Five years later he shall be two and a half times as old as his son. How old is Sumit at present?
(a) 45
(b) 50
(c) 35
(d) 42
Sol: www.cbse.site/ma/cm241

205. For what value of \( k \), will the following pair of equations have infinitely many solutions:
\[ 2x + 3y = 7 \quad \text{and} \quad (k+2)x - 3(1-k)y = 5k + 1 \]
(a) 2
(b) 4
(c) 6
(d) 8
Sol: www.cbse.site/ma/cm239

Direction For Question: (206-207)
Find the value of \( p \) and \( q \) for which the system of equations represent coincident lines:
\[ 2x + 3y = 7, \quad (p + q + 1)x + (p + 2q + 2)y = 4(p + q) + 1 \]

206. The value of \( q \) will be
(a) 1
(b) 2
(c) 3
(d) 4
Sol: www.cbse.site/ma/cm240

207. The value of \( p \) will be
(a) 3
(b) 4
(c) 5
(d) 6
Sol: www.cbse.site/ma/cm240

Direction For Question: (26-27)
Solve the following pair of equations for \( x \) and \( y \):
\[ \frac{x+1}{2} + \frac{y-1}{3} = 9 \quad \text{and} \quad \frac{x-1}{3} + \frac{y+1}{2} = 8. \]

208. What is the value of \( x \)?
(a) 13
(b) 7
(c) 24
(d) 12
Sol: www.cbse.site/ma/cm241
209. What is the value of $y$?
(a) 15
(b) 7
(c) 24
(d) 12
Sol: www.cbse.site/ma/cm241

Direction For Question: (210-211)
Solve the following pair of equations for $x$ and $y$:
\[
\frac{6}{x-1} - \frac{3}{y-2} = 1
\]
\[
\frac{5}{x-1} - \frac{1}{y-2} = 2,
\text{where } x \neq 1, \ y \neq 2.
\]

210. What is the value of $x$?
(a) 8
(b) 6
(c) 7
(d) 4
Sol: www.cbse.site/ma/cm242

211. What is the value of $y$?
(a) 11
(b) 5
(c) 12
(d) 8
Sol: www.cbse.site/ma/cm242

212. Seven times a two digit number is equal to four times the number obtained by reversing the order of its digits. If the difference of the digits is 3, the number will be
(a) 38
(b) 36
(c) 46
(d) 64
Sol: www.cbse.site/ma/cm243

Direction For Question: (213-214)
Solve the following pair of equations for $x$ and $y$:
\[
\frac{a^2}{x} - \frac{b^2}{y} = 0, \ \frac{a^2b}{x} + \frac{b^2a}{y} = a + b,
\text{where } x \neq 0; \ y \neq 0.
\]

213. What is the value of $x$?
(a) $b^2$
(b) $a^2$
(c) $ab$
(d) $\frac{1}{2}ab$
Sol: www.cbse.site/ma/cm244

214. What is the value of $y$?
(a) $b^2$
(b) $a^2$
(c) $ab$
(d) $\frac{1}{2}ab$
Sol: www.cbse.site/ma/cm245

215. Find whether the following pair of linear equations has a unique solutions and select correct option.
\[7x - 4y = 49, 5x - 6y = 57\]
(a) no solution
(b) unique solution
(c) infinitely solution
(d) can’t say anything
Sol: www.cbse.site/ma/cm246

216. The solution of following systems is
\[7x - 4y = 49, 5x - 6y = 57\]
(a) $x = -7$ and $y = 8$
(b) $x = 6$ and $y = -7$
(c) $x = 3$ and $y = -7$
(d) $x = -7$ and $y = 6$
Sol: www.cbse.site/ma/cm247

217. What are the values of $x$ and $y$ for the following system of equation?
\[5x + 4y - 4 = 0
\]
\[x - 12y - 20 = 0
\]
(a) $-\frac{3}{2}$ and 2
(b) 2 and $-\frac{3}{2}$
(c) 1 and $-\frac{3}{2}$
(d) $-\frac{3}{2}$ and 1
Sol: www.cbse.site/ma/cm248
218. The present age of the father is twice the sum of the ages of his 2 children. After 20 years, his age will be equal to the sum of the ages of his children. What is the age of the father.
(a) 38 years
(b) 40 years
(c) 30 years
(d) 45 years

Sol: www.cbse.site/ma/cm249