10TH SSC MCQ - CH - LINEAR EQUATIONS IN TWO VARIABLES

DATE:

TIME: 28 Min

MARKS: 28

SEAT NO:

Note:-

1. All Questions are compulsory.
2. Numbers on the right indicate full marks.

Q.1 If 12x + 13y = 29 and 13x + 12y = 21 then x + y is _____ **(1)**

A) 4 B) -2

C) 2 D) - 4

Ans : C

Q.2 If the speed of the boat in still water is x km/hr and the speed of the steam is y km/hr then the speed of the boat down steam is _____ **(1)**

A) (x - y) km/hr B) (xy) km/hr

C) (x + y) km/hr D) $\left(\frac{x}{y}\right)\ \mathrm{km/hr}$

Ans : B

Q.3 For 3x + 5y = 8 and 5x + 3y = 16 is x + y is _____ **(1)**

A) 4 B) 3

C) 12 D) 9

Ans : B

Q.4 The sum of the digits of a two digit number is 9. If 27 is added to it the digits of the number get reversed then number is _____ **(1)**

A) 36 B) 12

C) 3 D) 19

Ans : A

Q.5 If x = a, y = b is the solution of the equations x – y = 2 and x + y = 4, then the values of a and b are, respectively _____ **(1)**

A) 3 and 5 B) 5 and 3

C) 3 and 1 D) –1 and –3

Ans : C

Q.6 Aruna has only Rs 1 and Rs 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is Rs 75, then the number of Rs 1 and Rs 2 coins are, respectively _____ **(1)**

A) 35 and 15 B) 35 and 20

C) 15 and 35 D) 25 and 25

Ans : D

Q.7 The difference between a two digit number and the number obtained by interchanging the digits is 27. What is the difference between the two digits of the number is _____ **(1)**

A) 9 B) 6

C) 12 D) 3

Ans : D

Q.8 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 of the son and the father are, respectively _____ **(1)**

A) 4 and 24 B) 5 and 30
C) 6 and 36 D) 3 and 24

Ans : C

Q.9 If in the equation x + 2y = 10 the value of y is 6 then value of x will be _____ **(1)**

A) –2 B) 2
C) 4 D) 5

Ans : A

Q.10 If the lines given by 3x + 2ky = 2 and 2x + 5y = 1 are parallel then value of k is _____ **(1)**

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

Ans : C

Q.11 What is the value of D if the equations x + y = 3; 3x - 2y = 4 are solved by Cramer's method. **(1)**

A) 5 B) -5
C) 1 D) -1

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

$$D = \begin{vmatrix} 1 & 1 \\ 3 & -2 \end{vmatrix}$$

= (1 x -2) - (1 x 3)
= -2 - 3
= -5

Ans : B

Q.12 Find the value of $\begin{vmatrix} 5 & 3 \\ -7 & -4 \end{vmatrix}$ **(1)**

A) –1 B) –41
C) 41 D) 1

Ans : D

Q.13 To draw graph of 4x + 5y = 19, find y when x = 1. **(1)**

A) 4 B) 3
C) 2 D) -3

4x + 5y = 19
x = 1
4(1) + 5y = 19
5y = 19 - 4
5y = 15
y = 3

Ans : B

Q.14 For simultaneous equations in variables x and y, $D_x = 49$, $D_y = -63$, $D = 7$ then what is x? **(1)**

A) 7 B) -7

C) $\frac{1}{7}$ D) $\frac{-1}{7}$

Ans : A

Q.15 ax + by = c and mx + ny = d and an ≠ bm then these simultaneous equations have _____. **(1)**

A) Only one common solutions. B) No solution

C) Infinite number of solutions. D) Only two solutions.

Ans : A

Q.16 If a numerator of which the half is greater than $\frac{1}{5}$ of the number by 15 then the number is _____. **(1)**

A) 50 B) 40

C) 80 D) None of these

Let the number be x

$\text{Half of the number} = \frac{1}{2}x$

$\text{A fifth of a number} = \frac{1}{5}x$

$\frac{1}{2}x - \frac{1}{5}x = 15$

$\frac{5x-2x}{10} = 15$

3x = 150

x = 50

Ans : A

Q.17 The number consists of two digits. The digits in the ten's place is 3 times the digit in the unit's place. If 54 is subtracted from the number the digits are reversed. The number is _____. **(1)**

A) 39 B) 92

C) 93 D) 94

Let the digit at unit place be y and at ten's place be x

Number is = 10x + y

From the first condition

x = 3y

From the second condition

10x + y - 54 = 10y + x

10x + y - 10y - x = 54

9x - 9y = 54

x - y = 6

Put x = 3y

3y - y = 6

2y = 6

y = 3

x = 3(3)

x = 9

∴ Required number is 93

Ans : C

Q.18 The denominator of a fraction exceeds the numerators by 2. If 5 be added to the numerator the fraction increases by unity. The fraction is _____. **(1)**

A) $\frac{5}{7}$ B) $\frac{1}{3}$

C) $\frac{7}{9}$ D) $\frac{3}{5}$

Let the numerator be x and denominator be y

$\text{Fraction} = \frac{x}{y}$

From the first condition

y = x + 2 ...(I)

From the second condition

$\frac{x+5}{y} = \frac{x}{y} + 1$

$\frac{x+5}{y} = \frac{x+y}{y}$

x + 5 = x + y

y = 5

Put y = 5 in equation (I)

5 = x + 2

x = 3

$\therefore \quad \text{Fraction} = \frac{3}{5}$

Ans : D

Q.19 The product of two numbers is 3200 and the quotient when the larger number is divided by the smaller is 2. The numbers are _____ **(1)**

A) $(16, 200)$ B) $(160, 20)$

C) $(60, 30)$ D) $(80, 40)$

Let the greater number be x and the smaller number be y

From the first condition,

xy = 3200 ...(I)

From the second condition

$\frac{x}{y} = 2$

x = 2y ...(II)

Substituing x = 2y in eq(I)

$2y \times y = 3200$

$2y^2 = 3200$

$y^2 = 1600$

y = 40

Substituing y = 40 in (II)

x = 2(40)

x = 80

Ans : D

Q.20 Ten years ago the age of a father was four times of his son. Ten years hence the age of the father will be twice that of his son. The present ages of the father and the son are _____. **(1)**

A) $(50, 20)$ B) $(60, 20)$

C) $(55, 25)$ D) None of these

Let the father age be x years and son's age be y years

		10 years ago	10 years hence
Father	x	x -10	x + 10
Son	y	y - 10	y + 10

From the first condition
x - 10 = 4(y - 10)
x - 10 = 4y - 40
x - 4y = - 40 + 10
x - 4y = -30 ...(I)
From the second condition
x + 10 = 2(y + 10)
x + 10 = 2y + 20
x - 2y = 20 - 10
x - 2y = 10 ...(II)
Subtracting (II) from (I)
x - 4y = -30
x - 2y = 10

_____
-2y = - 40
y = 20
Substituing y = 20 in (II)
x -2(20) = 10
x - 40 = 10
x = 10 + 40
x = 50
Father's age = 50 years
Son's age = 20 years
Ans : A

Q.21 Divide 56 into two equal parts such that three times the first part exceeds one third of the second by 48. The parts are _____. **(1)**

A) $(20, 36)$ B) $(25, 31)$
C) $(24, 32)$ D) None of these

Let the first part be x and second part be y
From first condition
x + y = 56 ...(I)
From second condition ...(II)
$3x = \frac{1}{3}y + 48$
$3x = \frac{y+144}{3}$
$9x = y + 144$
9x - y = 144 ...(I)
Adding equation (I) and (II)
x + y = 56
+ 9x - y = 144

_____
10x = 200
x = 20
Substituing value of x = 20 in eq(I)
20 + y = 56
y = 56 - 20
y = 36
$\therefore$ The parts are 20 and 36
Ans : A

Q.22 The diagonal of a rectangle is 5 cm and one of at side is 4 cm. It's area is _____. **(1)**

A) 20 sq. cm B) 12 sq. cm

C) 10 sq. cm D) None of these

Let the length of rectangle be x cm abd breadth of rectangle be y cm

$\therefore$ x = 4cm

Diagonal of a rectangle = 5cm

We know that $(\text{Length})^2 + (\text{Breadth})^2 = (\text{Diagonal})^2$

$$x^2 + y^2 = 5^2$$
$$4^2 + y^2 = 25$$
$$y^2 = 25 - 16$$
$$y^2 = 9$$
$$y = 3$$

Area of rectangle = xy

= 4 x 3

= 12 sq.cm

Ans : B

Q.23 The sum of two numbers is 52 and their difference is 2. The numbers are _____. **(1)**

A) 17 and 15 B) 12 and 10

C) 27 and 25 D) None of these

Let the numbers be x and y respectively.

x + y = 52 (I)

x - y = 2 (II)

Now by elimination method,

2x = 54

x = 27

Now put x = 27 in eq(I),

27 + y = 52

y = 52 - 27

y = 25

The numbers are 27 and 25

Ans : C

Q.24 The point of intersection of the lines $2x - 5y = 6$ and $x + y = 3$ is _____. **(1)**

A) $(0, 3)$ B) $(3, 0)$

C) $(3, 3)$ D) $(0, 0)$

Ans : B

Q.25 If the length of a rectangle is 5 cm more than the breadth and if the perimeter of the rectangle is 40 cm, then the length, breadth of the rectangle will be_____ **(1)**

A) 7.5 cm, 2.5 cm B) 10 cm, 5 cm

C) 12.5 cm, 7.5 cm D) 15.5 cm, 10.5 cm

Let the breadth be x cm
Length = x + 5 cm
Perimeter of rectangle = 2(l + b)
Perimeter of rectangle is 40 cm
2 (x + 5 + x) = 4x + 10 cm
4x + 10 = 40
4x = 30
$x = \frac{30}{4} = 7.5$
Length = x + 5 cm = 7.5 + 5 = 12.5
Length is 12.5 cm and breadth is 7.5 cm
Ans : C

Q.26 The sum of the digits of a two-digit number is 10. If 18 be subtracted from it the digits in the resulting number will be interchanged. The number is **(1)**

A) 46 B) 64
C) 65 D) None of these

Let the digit in unit place be y and tens place be x
let the number be = 10x + y
From the first condition
x + y = 10 ....(I)
From the second condition
10x + y -18 = 10y + x
10x + y - 10y - x = 18
9x - 9y = 18
x - y = 2 . ...(II)
Adding equation (I) and (II)
x + y = 10
x - y = 2

2x = 12
x = 6
Substituting x = 6 in (I)
6 + y = 10
y = 10 - 6
y = 4
$\therefore$ The number is 64
Ans : B

Q.27 A man went to the Reserve Bank of India with ₹ 1,000. He asked the cashier to give him ₹ 5 and ₹ 10 notes only in return. The man got 175 notes in all. Find how many notes of ₹ 5 and ₹ 10 did he receive? **(1)**

A) $(25, 150)$ B) $(40, 110)$
C) $(150, 25)$ D) None

Let Rs. 5 note be x and Rs. 10 note be y
According to the question,
$x + y = 175$ ...(I)
$y = 175 - x$
Put in eq(II)
$5x + 10y = 1000$ ...(II)
$5x - 10(175 - x) = 1000$
$5x - 1750 - 10x = 1000$
$-5x = 1000 - 1750$
$-5x = -750$
$x = 150$
Put value of x in equation(I)
$150 + y = 175$
$y = 175 - 150$
$y = 25$
∴ Rs. 5 note be 150 and Rs. 10 note be 25

Ans : C

Q.28 A man starts his job with a certain monthly salary and earns a fixed increment every year. If his salary was ₹ 1,500 after 4 years of service and ₹ 1,800 after 10 years of service, what was his starting salary and what is the annul increment in rupees? **(1)**

A) ₹ 1,300, ₹ 50 B) ₹ 1,100, ₹ 50
C) ₹ 1,500, ₹ 30 D) None

Let, his starting salary be x and annul increment be y
Salary after 4 year = x + 4y
According to the condition
$x + 4y = 1500$ ...(I)
And salary after 10 years = x + 10
$x + 10 = 1800$ ...(II)
Subtract (II) from (I)
$x + 10 = 1800$
$- x + 4y = 1500$
_____
$6y = 300$
$y = 50$
Putting the value of y in equation(I)
$x + 4y = 1500$
$x + 4 \times 50 = 1500$
$x = 1500 - 200$
$x = 1300$
∴ His starting salary = 1300 ₹
∴ Annual increment = 50 ₹

Ans : A