Linear Equations Questions for CGL Tier 2, CGL Tier 1 and SSC 10+2

Linear Equations Quiz 3

Direction: Study the following questions carefully and choose the right answer.

1. If a two-digit number is added to a number obtained by reversing the digits of the given number, then the sum is always divisible by which one of the following numbers?

A. 7 B. 9

C. 10 D. 11

2. What is the sum of two numbers whose differences is 45 and the quotient of the greater number by the lesser number is 4?

A. 100 B. 90

C. 80 D. 75

3. If one-third of a two-digit number exceeds its one-fourth by 8, then what is the sum of the digits of the number?

A. 6 B. 13

C. 15 D. 17

4. A person bought 5 tickets from a station P to a station Q and 10 tickets from the station P to a station R. He paid Rs. 350. If the sum of a ticket from P to Q and a ticket from P to R is Rs. 42, then what is the fare from P to Q?

A. Rs. 12 B. Rs. 14

C. Rs. 16 D. Rs. 18

5. If $6x - 5y = 13$, $7x + 2y = 23$ then $11x + 18y = ?$

A. -15 B. 51

C. 33 D. 15

6. If $x + y + z = 13$ and $x^2 + y^2 + z^2 = 69$, then $xy + z(x + y)$ is equal to

A. 70 B. 40

C. 50 D. 60

7. If $5x + 9y = 5$ and $125x^3 + 729y^3 = 120$ then the value of the product of x and y is:

A. 45 B. 135

C. 1/45 D. 1/35

8. The area bounded by the lines $x = 0$, $y = 0$, $x + y = 1$, $2x + 3y = 6$ (in square units) is

A. 2 B. $2\frac{1}{3}$

C. $2\frac{1}{2}$ D. 3

9. The area of the triangle formed by the graph of $3x + 4y = 12$, x-axis and y-axis (in sq. units) is

A. 4 B. 12

C. 6 D. 8

10. The straight line $4x + 3y = 12$ passes through:

A. 1st, 2nd and 3rd quadrant B. 1st, 2nd and 4th quadrant

C. 2nd, 3rd and 4th quadrant D. 1st, 3rd and 4th quadrant

Correct answers:

1	2	3	4	5	6	7	8	9	10
D	D	C	B	B	C	D	C	C	B

Explanations:

1). Let a two-digit number be $(10x + y)$ and reversing number be $(10y + x)$

$\therefore$ Required sum $= 10x + y + 10y + x = 11x + 11y = 11(x + y)$

Hence, it's divisible by 11.

Hence, option D is correct.

2). Let the greater number be x and smaller number be y

$\therefore$ $x - y = 45$ ..... (i)

and $x = 4y$ ..... (ii)

From eqs. (i) and (ii)

$4y - y = 45$

$\Rightarrow$ $y = 45/3 = 15$

On putting the value of y in Eq. (ii), we get

$x = 4 \times 15 = 60$

Hence, required sum $= x + y = 60 + 15 = 75$.

Hence, option D is correct.

3). Let the number be y,

$\therefore\ \frac{y}{3} = \frac{y}{4} + 8 \Rightarrow \frac{4y - 3y}{12} = 8$

$\Rightarrow y = 12 \times 8 = 96$

$\therefore$ Sum of digits = 9 + 6 = 15.

Hence, option C is correct.

4). Let the fare from station P to station Q is Rs. x and the fare from station P to station R is Rs. y.

By given condition, $x + y = 42$ .....(i)

and $5x + 10y = 350$ .... (ii)

On solving Eqs. (i) and (ii), we get

$x = 14$ and $y = 28$

Hence, fare from station P to station Q is Rs. 14.

Hence, option B is correct.

5). $6x - 5y = 13$ ...... (i)

$7x + 2y = 23$ ...... (ii)

By equation (i) × 2 & (ii) × 5,

$12x - 10y = 26$ ..... (iii)

$35x + 10y = 115$ ...... (iv)

by solving these equation we get

$x = 3, \quad y = 1$

$\therefore \quad 11x + 18y = 11 \times 3 + 18 \times 1 = 33 + 18 = 51.$

Hence, option B is correct.

6). $x + y + z = 13$

$x^2 + y^2 + z^2 = 69$

$(x + y + z)^2 = x^2 + y^2 + z^2 + 2(xy + yz + zx)$

$\Rightarrow \quad (13)^2 = 69 + 2[xy + z(x + y)]$

$\Rightarrow \quad 2[xy + z(x + y)] = 169 - 69 = 100$

$\Rightarrow \quad [xy + z(x + y)] = \dfrac{100}{2} = 50.$

Hence, option C is correct.

7). Given,

$5x + 9y = 5 \quad .....(i)$

$125x^3 + 729y^3 = 120 \quad ....(ii)$

Make whole cube of 1st equation, we get

$(5x + 9y)^3 = (5)^3$

$\Rightarrow \quad 125x^3 + 729x^3 + 3 \times 5x \times 9y\ (5x + 9y) = 125$

Put the value of given terms in equation

$\Rightarrow \quad 125x^3 + 729x^3 + 3 \times 5x \times 9y\ (5x + 9y) = 125$

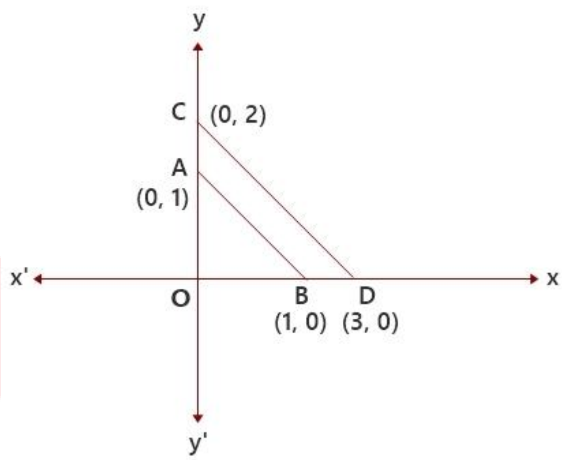
⇒ 120 + 135xy × 5 = 125

⇒ 135xy × 5 = 5

⇒ xy = 1/135.

Hence, option D is correct.

8).



x = 0 is the equation of y-axis.

y = 0 is the equation of x-axis.

Putting x = 0 in x + y = 1, y = 1

Putting y = 0 in x + y = 1, x = 1

Putting x = 0 in 2x + 3y = 6

3y = 6 ⇒ y = 2

Putting y = 0 in 2x + 3y = 6 ⇒ 2x = 6 ⇒ x = 3

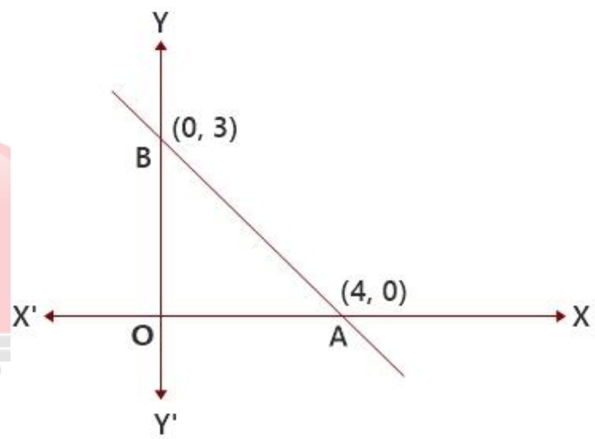
∴ OB = 1; OA = 1 OD = 3; OC = 2 ∴ Required area = ΔOCD – ΔOAB

$= \frac{1}{2} \times 3 \times 2 - \frac{1}{2} \times 1 \times 1$

$= 3 - \frac{1}{2} = 2\frac{1}{2}$ sq. units

Hence, option C correct.

9).



x-axis ⇒ y = 0, putting in equation 3x + 4y = 12

3x = 12 ⇒ x = 4

⇒ Co-ordinates of point of intersection on x-axis = (4, 0)

Putting on y-axis = (0, 3)

∴ (0, 3)

OA = 4

OB = 3

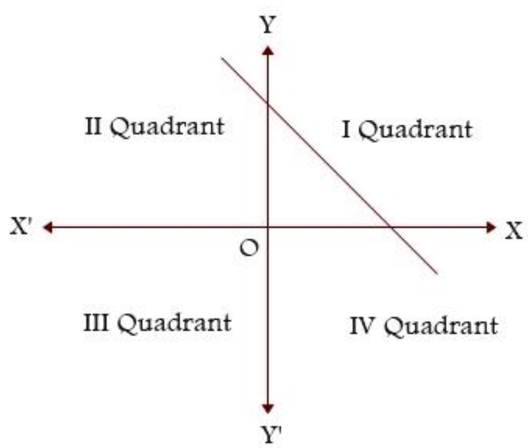
$= \frac{1}{2} \times OA \times OB = \frac{1}{2} \times 4 \times 3 = 6$ sq. units

Hence, option C is correct.

10). Putting $y = 0$ in $4x + 3y = 12$

we get $x = 3$

Putting $x = 0$ in $4x + 3y = 12$, we get $y = 4$



Hence, option B is correct.