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

Linear Equations Quiz 2

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

1. The equations ax + b = 0 and cx + d = 0 are consistent, if

A. ad = bc

B. ad + bc = 0

C. ab – cd = 0

D. ab + cd = 0

2. Points A and B are 60 km apart. A bus starts from A and another from B at the same time. If they go in the same direction they meet in 6 hours and if they go in opposite direction they meet in 2 hours. The speed of the bus with greater speed is:

A. 10 km/hr

B. 20 km/hr

C. 30 km/hr

D. 40 km/hr

3. A railway half ticket costs half the full fare but the reservation charges are the same for half ticket as well as for full ticket. one reserved first class ticket for a journey between two stations is Rs. 362 and one full and one half reserved first class tickets cost Rs. 554. The reservation charges are:

A. Rs. 18

B. Rs. 22

C. Rs. 38

D. Rs. 46

4. What is the value of x + y in the solution of the equations?

$\frac{x}{4}+\frac{y}{3}=\frac{5}{12}$ and $\frac{x}{2}+y=1$ is:

A. 1/3

B. 3/2

C. 2

D. 5/2

5. The number of solutions of these equations

$\mathbf{x + \frac{1}{y} = 2 \text{ and } 2xy - 3y = -2 \text{ is}}$:

A. 0 B. 1

C. 2 D. None of these

6. Find the value of x and y.

$\mathbf{\frac{1}{2x} - \frac{1}{y} = -1 \quad \ldots.(i)}$

$\mathbf{\frac{1}{x} + \frac{1}{2y} = 8 \quad \ldots.(ii)}$

$A.\frac{1}{3}, \frac{1}{4}$ $B.\frac{1}{6}, \frac{1}{4}$

$C.\frac{1}{6}, \frac{1}{5}$ $D.\frac{1}{3}, \frac{1}{5}$

7. Find the value of u and v.

$\mathbf{\frac{40}{u+v} + \frac{2}{u-v} = 5 \quad \ldots.(i)}$

$\mathbf{\frac{25}{u+v} - \frac{3}{u-v} = 1 \quad \ldots.(ii)}$

A. 6, 4 B. 1, 3

C. 5, 7 D. 3, 1

8. The sum of the digits of a two digit number is 8. the difference between these numbers and the number obtained by reversing it is 18. Find the two digit number.

A. 48 B. 32

C. 53 D. 58

9. Divide 243 in three points, so that half of I part, 1/3rd of II part and 1/4th of the III part shall be equal.

A. 53, 81, 109

B. 54, 71, 109

C. 53, 71, 98

D. 54, 81, 108

10. A man's age is p% of what it was 20 years ago but q% of what he will be after 10 years. What is his present age?

A. q/p

B. p/q

C. $\frac{10\ (q\ +\ 2p)}{p\ -\ q}$

D. $\frac{5\ (q\ +\ 3p)}{p\ -\ q}$

Correct answers:

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

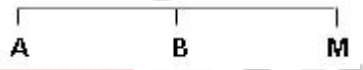
Explanations:

1). These equation are consistent if $\frac{a}{c} = \frac{b}{d}$ i.e ad = bc.

Hence, option A is correct.

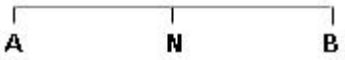
2). Let their speeds be x km/hr and y km/hr.

When they move in same direction, let them meet at M. Then, AM – BM = AB



∴ 6x – 6y = 60 or x – y = 10 ...(i)

When they move in opposite direction, let them meet at N. Then, AN + BN = AB



2x + 2y = 60 or x + y = 30 ...(ii)

Solving (i) and (ii) we get x = 20, y = 10.

Hence, option B is correct.

3). Let first class fare be Rs. x and reservation charges be Rs. y. Then

$x + y = 362$ & $(x + y) + (\frac{1}{2}x + y) = 554$.

∴ $x + y = 362$ & $3x + 4y = 1108$.

Solving these equations, we get: y = 22.

Hence, option B is correct.

4). Given equations,

$3x + 4y = 5$ ..... (i)

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

Solving (i) and (ii), we get

$y = \frac{1}{2}$ and $x = 1$. so $x + y = \frac{3}{2}$.

Hence, option B is correct.

5). First equation gives: $\frac{1}{y} = 2 - x$ or $y = \frac{1}{2 - x}$.

Second equation is: $y(2x - 3) = -2$ or $\frac{2x - 3}{2 - x} = -2$.

$\therefore 2x - 3 = -2(2 - x)$. This gives $1 = 0$.

This is impossible. So there is no solution at all.

Hence, option A is correct.

6). $\frac{1}{2x} - \frac{1}{y} = -1$ ....(i)

$\frac{1}{x} + \frac{1}{2y} = 8$ ....(ii)

Dividing equation (i) by 2

$$\frac{1}{4x}-\frac{1}{2y}=\frac{-1}{2}$$

$$\frac{1}{x}+\frac{1}{2y}=8$$

$$\frac{1}{x}[\frac{1}{4}+1]=8-\frac{1}{2}$$

$$\frac{1}{x}[\frac{5}{4}]=\frac{15}{2}\Rightarrow x=\frac{1}{6}$$

Putting $x=\frac{1}{6}$ in equation (ii)

$$6+\frac{1}{2y}=8\Rightarrow\frac{1}{2y}=2\Rightarrow y=\frac{1}{4}.$$

Hence, option B is correct.

7). $\frac{40}{u+v}+\frac{2}{u-v}=5$ ....(i)

$$\frac{25}{u+v}-\frac{3}{u-v}=1 \text{ ....(ii)}$$

Multiplying equation (i) by 5 and equ. (ii) by 8, we get,

$$\frac{200}{u+v}+\frac{10}{u-v}=25 \text{ ....}\mathbf{(a)}$$

$$\frac{200}{u+v}-\frac{24}{u-v}=8 \text{ ....}\mathbf{(b)}$$

Subtracting eq. (b) from (a)

$\frac{34}{u-v} = 25 - 8$

$u - v = \frac{34}{17} = 2 \rightarrow [A]$

Putting the value of u – v in eq. (i) we get

$u + v = 10 \rightarrow [B]$

Solving eq. [A] and [B]

$u - v = 2$; $u + v = 10$

$2u = 12 \Rightarrow u = 6$. So, $v = 4$.

Hence, option A is correct.

8). Let the number be $xy = 10x + y$

$x + y = 8$ …….(i)

$(10x + y) - (10y + x) = 18$

$9x - 9y = 18$

$x - y = 2$ …..(ii); Solving equation (i) & (ii)

$x = 5, y = 3$.

So, the number is 53.

Hence, option C is correct.

9). Let the parts be A, B and C.

Acc. To question –

$\frac{A}{2} = \frac{B}{3} = \frac{C}{4}$; $C = 2A$, $B = \frac{3}{2}A$.

A + B + C = 243

$A + \frac{3}{2}A + 2A = 243$

2A + 3A + 4A = 486.

9A = 486; A = 54

$B = \frac{3}{2} \times 54 = 81.$

C = 2A = 54 × 2 = 108.

Hence, option D is correct.

10). Let present age be x

x = – p% of (x – 20).

x = – q% of (x + 10).

p% of (x – 20) = q% of (x + 10)

px – 20p = qx + 10q

x (p – q) = 10q + 20 p = 10 (q + 2p)

(p – q)x = 10q + 20p = 10(q + 2p)

$x = \frac{10\,(q + 2p)}{p - q}$.

Hence, option C is correct.