Linear Equations
Ex 8C

Q1

Answer :

(c) 5

$2x - 3 = x + 2$
$\Rightarrow 2x - x = 3 + 2$
$\Rightarrow x = 5$

Q2

Answer :

$(b) \ -5$

$5x + \frac{7}{2} = \frac{3}{2}x - 14$
$\Rightarrow \frac{10x + 7}{2} = \frac{3x - 28}{2}$
$\Rightarrow 10x + 7 = 3x - 28$
$\Rightarrow 10x - 3x = -28 - 7$
$\Rightarrow 7x = -35$
$\Rightarrow x = \frac{-35}{7} = -5$

Q3

Answer :

(a) 40

$z = \frac{4}{5}\left(z + 10\right)$
$\Rightarrow 5z = 4\left(z + 10\right)$
$\Rightarrow 5z = 4z + 40$
$\Rightarrow 5z - 4z = 40$
$\Rightarrow z = 40$

Q4

Answer :

(c) $\frac{4}{5}$

$3m = 5m - \frac{8}{5}$
$\Rightarrow 3m = \frac{25m - 8}{5}$
$\Rightarrow 15m = 25m - 8$
$\Rightarrow 15m - 25m = -8$
$\Rightarrow -10m = -8$
$\Rightarrow m = \frac{-8}{-10} = \frac{4}{5}$

Q5

Answer :

(b) -1

$5t - 3 = 3t - 5$
$\Rightarrow 5t - 3t = 3 - 5$
$\Rightarrow 2t = -2$
$\Rightarrow t = \frac{-2}{2} = -1$

Q6

Answer :

(d) $\frac{7}{3}$

$2y + \frac{5}{3} = \frac{26}{3} - y$
$\Rightarrow \frac{6y + 5}{3} = \frac{26 - 3y}{3}$
$\Rightarrow 6y + 5 = 26 - 3y$
$\Rightarrow 6y + 3y = 26 - 5$
$\Rightarrow 9y = 21$
$\Rightarrow y = \frac{21}{9} = \frac{7}{3}$

Q7

Answer :

(b) -1

$$\frac{6x+1}{3} + 1 = \frac{x-3}{6}$$
$$\Rightarrow \frac{6x+1+3}{3} = \frac{x-3}{6}$$
$$\Rightarrow 6\left(6x+4\right) = 3\left(x-3\right)$$
$$\Rightarrow 36x + 24 = 3x - 9$$
$$\Rightarrow 36x - 3x = -24 - 9$$
$$\Rightarrow 33x = -33$$
$$\Rightarrow x = \frac{-33}{33} = -1$$

Q8

Answer :

(c) 36

$$\frac{n}{2} - \frac{3n}{4} + \frac{5n}{6} = 21$$
$$\Rightarrow \frac{6n - 9n + 10n}{12} = 21$$
$$\Rightarrow 7n = 21 \times 12$$
$$\Rightarrow 7n = 252$$
$$\Rightarrow n = \frac{252}{7} = 36$$

Q9

Answer :

(d) $\frac{1}{2}$

$$\frac{x+1}{2x+3} = \frac{3}{8}$$
$$\Rightarrow 8\left(x+1\right) = 3\left(2x+3\right)$$
$$\Rightarrow 8x + 8 = 6x + 9$$
$$\Rightarrow 8x - 6x = 9 - 8$$
$$\Rightarrow 2x = 1$$
$$\Rightarrow x = \frac{1}{2}$$

Q10

Answer :

(c) 8

$$\frac{4x+8}{5x+8} = \frac{5}{6}$$
$$\Rightarrow 6\left(4x+8\right) = 5\left(5x+8\right)$$
$$\Rightarrow 24x + 48 = 25x + 40$$
$$\Rightarrow 24x - 25x = -48 + 40$$
$$\Rightarrow -x = -8$$
$$\Rightarrow x = 8$$

Q11

Answer :

(d) 12

$$\frac{n}{n+15} = \frac{4}{9}$$
$$\Rightarrow 9n = 4\left(n+15\right)$$
$$\Rightarrow 9n = 4n + 60$$
$$\Rightarrow 9n - 4n = 60$$
$$\Rightarrow 5n = 60$$
$$\Rightarrow n = \frac{60}{5} = 12$$

Q12

Answer :

(a) -2

$$3\left(t-3\right) = 5\left(2t+1\right)$$
$$\Rightarrow 3t - 9 = 10t + 5$$
$$\Rightarrow 3t - 10t = 9 + 5$$
$$\Rightarrow -7t = 14$$
$$\Rightarrow -t = \frac{14}{7} = 2$$
$$\Rightarrow t = -2$$

Q13

Answer :

(c) 80

Let the number be x.

$\therefore \frac{4}{5}x = \frac{3}{4}x + 4$

$\Rightarrow \frac{4x}{5} = \frac{3x+16}{4}$

$\Rightarrow 16x = 15x + 80$

$\Rightarrow 16x - 15x = 80$

$\Rightarrow x = 80$

Q14

Answer :

(b) 28 years

Let x be the common multiple of the ages of A and B.

Then. the ages of A and B would be 5x and 7x, respectively.

$\therefore \frac{5x+4}{7x+4} = \frac{3}{4}$

$\Rightarrow 4\left(5x+4\right) = 3\left(7x+4\right)$

$\Rightarrow 20x + 16 = 21x + 12$

$\Rightarrow 16 - 12 = 21x - 20x$

$\Rightarrow 4 = x$

$\Rightarrow x = 4$

$\therefore$ Age of $B = 7\left(x\right) = 7 \times 4$

$= 28$ years

Q15

Answer :

(b) 5 cm

Let the equal side of the isosceles triangle be x.

Then, the perimeter of the triangle would be $\left(x + x + 6\right)$.

$\therefore 2x + 6 = 16$

$\Rightarrow 2x = 16 - 6$

$\Rightarrow 2x = 10$

$\Rightarrow x = \frac{10}{2} = 5$

$\therefore$ Length of each equal side $= 5$ cm

Q16

Answer :

(d) 17

Let the three consecutive integers be x, x + 1 and x + 2.

Equation $= x + x + 1 + x + 2 = 51$

$\Rightarrow 3x + 3 = 51$

$\Rightarrow 3x = 51 - 3$

$\Rightarrow 3x = 48$

$\Rightarrow x = \frac{48}{3} = 16$

Middle integer $= x + 1 = 16 + 1 = 17$

Q17

Answer :

(a) 40

Let the numbers be x and x + 15.

$\therefore x + x + 15 = 95$

$\Rightarrow 2x + 15 = 95$

$\Rightarrow 2x = 95 - 15$

$\Rightarrow 2x = 80$

$\Rightarrow x = 40$

The smaller number is 40.

Q18

Answer :

(c) 48

Let the number of boys in the class be x.

Then, the number of girls will be $\left(x-8\right)$.

The equation becomes :

$\frac{x}{x-8}=\frac{7}{5}$

$\Rightarrow 5x=7x-56$

$\Rightarrow 5x-7x=-56$

$\Rightarrow -2x=-56$

$\Rightarrow x=\frac{-56}{-2}=28$

Therefore, the number of boys is 28.

Number of girls $=\left(x-8\right)=28-8=20$

Total strength of the class $=28+20=48$