



Exercise 8B

Q1

Answer :

Let the numbers be $8x$ and $3x$.

$$8x + 3x = 143$$

$$\Rightarrow 11x = 143$$

$$\Rightarrow x = \frac{143}{11}$$

$$\Rightarrow x = 13$$

$$\therefore \text{One number} = 8x = 8 \times 13 = 104$$

$$\text{Other number} = 3x = 3 \times 13 = 39$$

Q2.

Answer :

Let the original number be x .

$\frac{2}{3}$ of the number is 20 less than the original number.

$$\therefore \frac{2}{3}x = x - 20$$

$$\Rightarrow \frac{2x}{3} = x - 20$$

$$\Rightarrow 2x = 3(x - 20) \quad (\text{by cross multiplication})$$

$$\Rightarrow 2x = 3x - 60$$

$$\Rightarrow 2x - 3x = -60$$

$$\Rightarrow -x = -60$$

$$\Rightarrow x = 60$$

Therefore, the original number is 60.

Q3.

Answer :

Let the number be x .

Four fifths of the number is 10 more than two thirds of the number.

$$\begin{aligned}\therefore \frac{4}{5}x &= 10 + \frac{2}{3}x \\ \Rightarrow \frac{4x}{5} &= 10 + \frac{2x}{3} \\ \Rightarrow \frac{4x}{5} &= \frac{30+2x}{3} && \left(L.C.M. \text{ of } 1 \text{ and } 3 \text{ is } 3 \right) \\ \Rightarrow 3(4x) &= 5(30+2x) && \left(\text{by cross multiplication} \right) \\ \Rightarrow 12x &= 150 + 10x \\ \Rightarrow 12x - 10x &= 150 \\ \Rightarrow 2x &= 150 \\ \Rightarrow x &= \frac{150}{2} = 75\end{aligned}$$

Therefore, the number is 75.

Q4.

Answer :

Let one part be x .

7 times the first part = $7x$

Let the other part be $(24 - x)$.

5 times the second part = $5(24 - x)$

$$\begin{aligned}\therefore 7x + 5(24 - x) &= 146 \\ \Rightarrow 7x + 120 - 5x &= 146 \\ \Rightarrow 7x - 5x &= 146 - 120 \\ \Rightarrow 2x &= 26 \\ \Rightarrow x &= \frac{26}{2} = 13\end{aligned}$$

Therefore, one part is 13.

$$\text{Other part} = (24 - x) = (24 - 13) = 11$$

Q5.

Answer :

Let the number be x .

Fifth part increased by 5 = $\frac{x}{5} + 5$

Fourth part diminished by 5 = $\frac{x}{4} - 5$

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

$$\Rightarrow 5 + 5 = \frac{x}{4} - \frac{x}{5}$$

$$\Rightarrow 10 = \frac{5x - 4x}{20}$$

$$\Rightarrow 10 = \frac{x}{20}$$

$$\Rightarrow 200 = x$$

$$\Rightarrow x = 200$$

Therefore, the number is 200.

Q6.

Answer :

Let the common multiple for the given three numbers be x .

Then, the three numbers would be $4x$, $5x$ and $6x$.

$$\therefore 4x + 6x = 5x + 55$$

$$\Rightarrow 10x = 5x + 55$$

$$\Rightarrow 10x - 5x = 55$$

$$\Rightarrow 5x = 55$$

$$\Rightarrow x = \frac{55}{5} = 11$$

$$\therefore \text{Smallest number} = 4x = 4(11) = 44$$

$$\text{Largest number is} = 6x = 6(11) = 66$$

$$\text{Third number} = 5x = 5(11) = 55$$

Therefore, *the* three numbers are 44, 55 and 66.

Q7.

Answer :

Let the number be x .

$$\therefore 10 + 4x = 5x - 5$$

$$\Rightarrow 10 + 5 = 5x - 4x$$

$$\Rightarrow 15 = x$$

$$\Rightarrow x = 15 \text{ (by transposition)}$$

Therefore, the number is 15.

Q8.

Answer :

Let us consider x as the common multiple of both the number.

Then, first number = $3x$

Second number = $5x$

$$\therefore \frac{3x+10}{5x+10} = \frac{5}{7}$$

$$\Rightarrow 7(3x+10) = 5(5x+10) \quad \text{(by cross multiplication)}$$

$$\Rightarrow 21x + 70 = 25x + 50$$

$$\Rightarrow 21x - 25x = 50 - 70$$

$$\Rightarrow -4x = -20$$

$$\Rightarrow x = \frac{-20}{-4} = 5$$

Therefore, the common multiple of both the numbers is 5.

$$\text{First number} = 3x = 3 \times 5 = 15$$

$$\text{Second number} = 5x = 5 \times 5 = 25$$

Q9.

Answer :

Let the first odd number be x .

Let the second odd number be $(x + 2)$.

Let the third odd number be $(x + 4)$.

$$\therefore x + (x + 2) + (x + 4) = 147$$

$$\Rightarrow x + x + 2 + x + 4 = 147$$

$$\Rightarrow 3x + 6 = 147$$

$$\Rightarrow 3x = 147 - 6$$

$$\Rightarrow 3x = 141$$

$$\Rightarrow x = \frac{141}{3} = 47$$

Therefore, the first odd number is 47.

$$\text{Second odd number} = (x + 2) = (47 + 2) = 49$$

$$\text{Third odd number} = (x + 4) = (47 + 4) = 51$$

Q10.

Answer :

Let the first even number be x .

Let the second even number be $x + 2$.

Let the third even number be $x + 4$.

$$\therefore x + x + 2 + x + 4 = 234$$

$$\Rightarrow x + x + 2 + x + 4 = 234$$

$$\Rightarrow 3x + 6 = 234$$

$$\Rightarrow 3x = 234 - 6$$

$$\Rightarrow 3x = 228$$

$$\Rightarrow x = \frac{228}{3} = 76$$

$$\therefore \text{First even number} = x = 76$$

$$\text{Second even number} = x + 2 = 76 + 2 = 78$$

$$\text{Third even number} = x + 4 = 80$$

Q11.

Answer :

Let the digit in the units place be x .

$$\text{Digit in the tens place} = (12 - x)$$

$$\therefore \text{Original number} = 10(12 - x) + x = 120 - 9x$$

On reversing the digits, we have x at the tens place and $(12 - x)$ at the units

place.

$$\therefore \text{New number} = 10x + 12 - x = 9x + 12$$

$$\text{New number} - \text{Original number} = 54$$

$$\Rightarrow 9x + 12 - (120 - 9x) = 54$$

$$\Rightarrow 9x + 12 - 120 + 9x = 54$$

$$\Rightarrow 18x - 108 = 54$$

$$\Rightarrow 18x = 54 + 108$$

$$\Rightarrow 18x = 162$$

$$\Rightarrow x = \frac{162}{18} = 9$$

Therefore, the digit in *the* units place is 9.

$$\text{Digit in tens place} = (12 - x) = (12 - 9) = 3$$

Therefore, the original number is 39.

Check :

The original number is 39.

$$\text{Sum of the digits in the original number} = (3 + 9) = 12$$

$$\text{New number obtained on reversing the digits} = 93$$

$$\text{New number} - \text{Original number} = (93 - 39) = 54$$

Thus, both the given conditions are satisfied by 39.

Hence, the original number *is* 39.

Q12.

Answer :

Let the digit in *the* units place be x .

$$\text{Digit in the tens place} = 3x$$

$$\text{Original number} = 10(3x) + x = 30x + x$$

On reversing the digits, we have x at the tens place and $(3x)$ at the units place.

$$\therefore \text{New number} = 10(x) + 3x = 10x + 3x$$

$$\text{New number} = \text{Original number} - 36$$

$$\Rightarrow 10x + 3x = 30x + x - 36$$

$$\Rightarrow 13x = 31x - 36$$

$$\Rightarrow 36 = 31x - 13x$$

$$\Rightarrow 36 = 18x$$

$$\Rightarrow 18x = 36$$

$$\Rightarrow x = \frac{36}{18} = 2$$

Therefore, the digit in *the* units place is 2.

$$\text{Digit in } the \text{ tens place} = (3x) = 3 \times 2 = 6$$

Therefore, the original number is 62.

Check :

$$\text{New number} + 36 = \text{Original Number}$$

$$26 + 36 = 62$$

Hence, both the conditions are satisfied.

Therefore, the original number *is* 62.

Q13.

Answer :

Let the numerator be x.

The denominator is greater than the numerator by 7.

$$\therefore (x + 7)$$

$$\therefore \frac{x + 17}{(x + 7) - 6} = 2$$

$$\Rightarrow \frac{x + 17}{x + 1} = 2$$

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