Ratio and Proportion Ex 9.1 Q1

Answer :

It is given that

$$x : y = 3 : 5 \Rightarrow \frac{x}{y} = \frac{3}{5}$$

Now, $3x + 4y : 8x + 5y$

$$= \frac{3x + 4y}{8x + 5y}$$

$$= \frac{\frac{3x + 4y}{y}}{\frac{8x + 5y}{y}}$$ {dividing the numerator and the denominator by 'y'}

$$= \frac{3\left(\frac{x}{y}\right) + 4}{8\left(\frac{x}{y}\right) + 5} = \frac{3\left(\frac{3}{5}\right) + 4}{8\left(\frac{3}{5}\right) + 5} = \frac{\frac{9}{5} + 4}{\frac{24}{5} + 5}$$

$$= \frac{\frac{9 + 20}{5}}{\frac{24 + 25}{5}} = \frac{\frac{29}{5}}{\frac{49}{5}} = \frac{29}{49}$$

Ratio and Proportion Ex 9.1 Q2

Answer :

It is given that

$$x : y = 8 : 9 \Rightarrow \frac{x}{y} = \frac{8}{9}$$

Now, $7x - 4y : 3x + 2y$

$$= \frac{7x - 4y}{3x + 2y}$$

$$= \frac{\frac{7x - 4y}{y}}{\frac{3x + 2y}{y}}$$ {dividing the numerator and the denominator by 'y'}

$$= \frac{7\left(\frac{x}{y}\right) - 4}{3\left(\frac{x}{y}\right) + 2} = \frac{7\left(\frac{8}{9}\right) - 4}{3\left(\frac{8}{9}\right) + 2} = \frac{\frac{56}{9} - 4}{\frac{24}{9} + 2}$$

$$= \frac{\frac{56 - 36}{9}}{\frac{24 + 18}{9}} = \frac{20}{42} = \frac{10}{21}$$

Hence, $7x - 4y : 3x + 2y = 10 : 21$.

Ratio and Proportion Ex 9.1 Q3

Answer :

Let the two numbers be 'x' and 'y' such that $x : y = 6 : 13 \Rightarrow \frac{x}{y} = \frac{6}{13}$.

We can assume that the HCF of 'x' and 'y' is a number 'k'.

So, $x = 6k$, and $y = 13k$.

Now, the product of any two numbers 'x' and 'y' is always equal to the product of their LCM and HCF

$\Rightarrow x \times y = 312 \times k$

$\Rightarrow 6k \times 13k = 312 \times k$

$\Rightarrow k = \frac{312}{6 \times 13} = 4$

$\Rightarrow k = 4$

Thus, $x = 6k = 6 \times 4 = 24$, and $y = 13 \times 4 = 52$.

Ratio and Proportion Ex 9.1 Q4

Answer :

Let the two numbers in ratio be x and y such that

$$x : y = 3 : 5$$

$$= \frac{x}{y} = \frac{3}{5} \Rightarrow x = \frac{3y}{5}. \quad \text{-------- (1)}$$

Now, 8 is added to each number, which means

$$= \frac{x+8}{y+8} = \frac{2}{3}$$

$$= \frac{\frac{3y}{5}+8}{y+8} = \frac{2}{3} \quad \text{------ From (1)}$$

$$= \frac{\frac{3y+40}{5}}{y+8} = \frac{2}{3}$$

On cross-multiplying, we get $\Rightarrow 3(3y + 40) = 2 \times 5(y + 8)$

$$\Rightarrow 9y + 120 = 10y + 80$$

$$\Rightarrow 120 - 80 = 10y - 9y$$

$$\Rightarrow y = 40$$

$$x = \frac{3y}{5} = \frac{3 \times 40}{5} = 24$$

So, the numbers are 24 and 40.

Ratio and Proportion Ex 9.1 Q5

Answer :

Let the numbers that must be added to the ratio 7 : 13 be 'x'.

So, $\frac{7+x}{13+x} = \frac{2}{3}$

After cross-multiplication, we get

$3(7 + x) = 2(13 + x)$

$21 + 3x = 26 + 2x$

$3x - 2x = 26 - 21$

$x = 5$

Thus, 5 must be added to each term to make the ratio = 2 : 3.

********** END **********