Pair of Linear Equations in Two varibles Ex 3.9 Q8

Answer :

Let the present age of father be x years and the present ages of his two children's be y and z years.
The present age of father is three times the sum of the ages of the two children's. Thus, we have

$$x = 3(y+z)$$

$$\Rightarrow y+z = \frac{x}{3}$$

After 5 years, father's age will be $(x+5)$ years and the children's age will be $(y+5)$ and $(z+5)$ years.
Thus using the given information, we have

$$x+5 = 2\{(y+5)+(z+5)\}$$

$$\Rightarrow x+5 = 2(y+5+z+5)$$

$$\Rightarrow x = 2(y+z)+20-5$$

$$\Rightarrow x = 2(y+z)+15$$

So, we have two equations

$$y+z = \frac{x}{3}$$

$$x = 2(y+z)+15$$

Here x, y and z are unknowns. We have to find the value of x.
Substituting the value of $(y+z)$ from the first equation in the second equation, we have
By using cross-multiplication, we have

$$x = \frac{2x}{3}+15$$

$$\Rightarrow x-\frac{2x}{3} = 15$$

$$\Rightarrow x(1-\frac{2}{3}) = 15$$

$$\Rightarrow \frac{x}{3} = 15$$

$$\Rightarrow x = 15\times 3$$

$$\Rightarrow x = 45$$

Hence, the present age of father is $\boxed{45}$ years.

Pair of Linear Equations in Two varibles Ex 3.9 Q9

Answer :

Let the present age of father be x years and the present age of his son be y years.
After 2 years, father's age will be $(x+2)$ years and the age of son will be $(y+2)$ years. Thus using the given information, we have

$$x+2 = 3(y+2)+8$$

$$\Rightarrow x+2 = 3y+6+8$$

$$\Rightarrow x-3y-12 = 0$$

Before 2 years, the age of father was $(x-2)$ years and the age of son was $(y-2)$ years. Thus using the given information, we have

$$x-2 = 5(y-2)$$

$$\Rightarrow x-2 = 5y-10$$

$$\Rightarrow x-5y+8 = 0$$

So, we have two equations

$$x-3y-12 = 0$$

$$x-5y+8 = 0$$

Here x and y are unknowns. We have to solve the above equations for x and y.

By using cross-multiplication, we have

$$\frac{x}{(-3)\times 8-(-5)\times(-12)}=\frac{-y}{1\times 8-1\times(-12)}=\frac{1}{1\times(-5)-1\times(-3)}$$

$$\Rightarrow \frac{x}{-24-60}=\frac{-y}{8+12}=\frac{1}{-5+3}$$

$$\Rightarrow \frac{x}{-84}=\frac{-y}{20}=\frac{1}{-2}$$

$$\Rightarrow \frac{x}{84}=\frac{y}{20}=\frac{1}{2}$$

$$\Rightarrow x=\frac{84}{2}, y=\frac{20}{2}$$

$$\Rightarrow x=42, y=10$$

Hence, the present age of father is $\boxed{42}$ years and the present age of son is $\boxed{10}$ years.

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