Pair of Linear Equations in Two varibles Ex 3.9 Q5

Answer :

Let the present age of father be x years and the present age of his son be y years.
After 10 years, father's age will be $(x+10)$ years and son's age will be $(y+10)$ years. Thus using the given information, we have

$$x+10=2(y+10)$$
$$\Rightarrow x+10=2y+20$$
$$\Rightarrow x-2y-10=0$$

Before 10 years, the age of father was $(x-10)$ years and the age of son was $(y-10)$ years. Thus using the given information, we have

$$x-10=12(y-10)$$
$$\Rightarrow x-10=12y-120$$
$$\Rightarrow x-12y+110=0$$

So, we have two equations

$$x-2y-10=0$$
$$x-12y+110=0$$

Here x and y are unknowns. We have to solve the above equations for x and y.
By using cross-multiplication, we have

$$\frac{x}{(-2)\times 110-(-12)\times(-10)}=\frac{-y}{1\times 110-1\times(-10)}=\frac{1}{1\times(-12)-1\times(-2)}$$
$$\Rightarrow \frac{x}{-220-120}=\frac{-y}{110+10}=\frac{1}{-12+2}$$
$$\Rightarrow \frac{x}{-340}=\frac{-y}{120}=\frac{1}{-10}$$
$$\Rightarrow \frac{x}{340}=\frac{y}{120}=\frac{1}{10}$$
$$\Rightarrow x=\frac{340}{10}, y=\frac{120}{10}$$
$$\Rightarrow x=34, y=12$$

Hence, the present age of father is $\boxed{34}$ years and the present age of son is $\boxed{12}$ years.

Pair of Linear Equations in Two varibles Ex 3.9 Q6

Answer :

Let the present age of father be x years and the present age of his son be y years.
The present age of father is three years more than three times the age of the son. Thus, we have

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

After 3 years, father's age will be $(x+3)$ years and son's age will be $(y+3)$ years.
Thus using the given information, we have

$$x+3=2(y+3)+10$$
$$\Rightarrow x+3=2y+6+10$$
$$\Rightarrow x-2y-13=0$$

So, we have two equations

$$x-3y-3=0$$
$$x-2y-13=0$$

Here x and y are unknowns. We have to solve the above equations for x and y.
By using cross-multiplication, we have

$$\frac{x}{(-3)\times(-13)-(-2)\times(-3)}=\frac{-y}{1\times(-13)-1\times(-3)}=\frac{1}{1\times(-2)-1\times(-3)}$$
$$\Rightarrow \frac{x}{39-6}=\frac{-y}{-13+3}=\frac{1}{-2+3}$$
$$\Rightarrow \frac{x}{33}=\frac{-y}{-10}=\frac{1}{1}$$
$$\Rightarrow \frac{x}{33}=\frac{y}{10}=1$$
$$\Rightarrow x=33, y=10$$

Hence, the present age of father is $\boxed{33}$ years and the present age of son is $\boxed{10}$ years.

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