## Pair of Linear Equations in Two varibles Ex 3.9 Q7

**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 times the age of the son. Thus, we have

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

After 12 years, father's age will be $(x+12)$ years and son's age will be $(y+12)$ years. Thus using the given information, we have

$$x + 12 = 2(y + 12)$$
$$\Rightarrow x + 12 = 2y + 24$$
$$\Rightarrow x - 2y - 12 = 0$$

So, we have two equations

$$x - 3y = 0$$
$$x - 2y - 12 = 0$$

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

$$\frac{x}{(-3)\times(-12)-(-2)\times 0} = \frac{-y}{1\times(-12)-1\times 0} = \frac{1}{1\times(-2)-1\times(-3)}$$
$$\Rightarrow \frac{x}{36-0} = \frac{-y}{-12-0} = \frac{1}{-2+3}$$
$$\Rightarrow \frac{x}{36} = \frac{-y}{-12} = \frac{1}{1}$$
$$\Rightarrow \frac{x}{36} = \frac{y}{12} = 1$$
$$\Rightarrow x = 36, y = 12$$

Hence, the present age of father is $\boxed{36}$ years and the present age of son is $\boxed{12}$ years.

## 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.

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