



### Quadratic Equations Ex 8.12 Q1

**Answer :**

Let  $B$  alone takes  $x$  days to finish the work. Then,  $B$ 's one day's work =  $\frac{1}{x}$ .

Similarly,  $A$  alone can finish it in  $(x-10)$  days to finish the work. Then,  $A$ 's one day's work =  $\frac{1}{x-10}$ .

It is given that

$A$ 's one day's work +  $B$ 's one day's work =  $(A+B)$ 's one day's work

$$\frac{1}{x} + \frac{1}{x-10} = \frac{1}{12}$$

$$\frac{x-10+x}{x(x-10)} = \frac{1}{12}$$

$$\frac{2x-10}{x(x-10)} = \frac{1}{12}$$

$$x^2 - 10x = 24x - 120$$

$$x^2 - 10x - 24x + 120 = 0$$

$$x^2 - 34x + 120 = 0$$

$$x^2 - 30x - 4x + 120 = 0$$

$$x(x-30) - 4(x-30) = 0$$

$$(x-30)(x-4) = 0$$

$$(x-30) = 0 \quad \text{or} \quad (x-4) = 0$$

$$x = 30 \quad \text{or} \quad x = 4$$

But  $x = 3$  is not correct.

therefore,  $x = 30$  is correct

Hence, the time taken by  $B$  to finish the work in  $\boxed{x = 30 \text{ days}}$

### Quadratic Equations Ex 8.12 Q2

**Answer :**

Let the first pipe takes  $x$  hours to fill the reservoir. Then the second pipe will takes =  $(x+10)$  hours to fill the reservoir.

Since, the faster pipe takes  $x$  hours to fill the reservoir.

Therefore, portion of the reservoir filled by the faster pipe in one hour =  $\frac{1}{x}$

So, portion of the reservoir filled by the faster pipe in 12 hours =  $\frac{12}{x}$

Similarly,

Portion of the reservoir filled by the slower pipe in 12 hours =  $\frac{12}{x+10}$

It is given that the reservoir is filled in 12 hours.

So,

$$\frac{12}{x} + \frac{12}{x+10} = 1$$

$$\frac{12(x+10) + 12x}{x(x+10)} = 1$$

$$12x + 120 + 12x = x^2 + 10x$$

$$x^2 + 10x - 24x - 120 = 0$$

$$x^2 - 14x - 120 = 0$$

$$x^2 - 20x + 6x - 120 = 0$$

$$x(x - 20) + 6(x - 20) = 0$$

$$(x - 20)(x + 6) = 0$$

$$(x - 20) = 0 \quad \text{or} \quad (x + 6) = 0$$

$$x = 20 \quad \quad \quad x = -6$$

But,  $x$  cannot be negative.

Therefore, when  $x = 20$  then

$$(x + 10) = 20 + 10$$

$$= 30$$

Hence, the second pipe will takes 30 hours to fill the reservoir.

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