



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

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

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

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

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

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

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

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

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

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

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

$$x = 30 \quad \quad \quad x = 4$$

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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