Quadratic Equations Ex 8.9 Q5

Answer :

Let the present age of two friends be x years and $(20 - x)$ years respectively.
Then, 4 years later, the age of two friends will be $(x - 4)$ years and $(20 - x - 4)$ years respectively
Then according to question,

$$(x-4)(20-x-4)=48$$
$$(x-4)(16-x)=48$$
$$16x-x^2-64+4x=48$$

-x2+20x-64-48=0
x2-20x+112=0
Let D be the discriminant of the above quadratic equation.
Then,

$$D=b^2-4ac$$

Putting the value of $a = 1$, $b = -20$ and $c = 112$
D=-202-4×1×112
$= 400 - 448$
$= -48$
Thus, $D<0$
So, the above equation does not have real roots.
Hence, the given situation is not possible.

Quadratic Equations Ex 8.9 Q6

Answer :

Let the present age of girl be x years then, age of her sister $\left(\frac{x}{2}\right)$ years

Then, 4 years later, age of girl $=(x+4)$ years and her sister's age be $\left(\frac{x}{2}+4\right)$ years

Then according to question,

$$(x+4)\left(\frac{x}{2}+4\right)=160$$
$$(x+4)(x+8)=160\times 2$$
$$x^2+8x+4x+32=320$$
$$x^2+12x+32-320=0$$
$$x^2+12x-288=0$$
$$x^2+12x-288=0$$
$$x^2-12x+24x-288=0$$
$$x(x-12)+24(x-12)=0$$
$$(x-12)(x+24)=0$$

So, either

$$(x-12)=0$$
$$x=12$$

Or

$$(x+24)=0$$
$$x=-24$$

But the age never be negative
Therefore, when $x=12$ then

$$\frac{x}{2}=\frac{12}{2}$$
$$=6$$

Hence, the present age of girl be $=\boxed{12 \text{ years}}$ and her sister's age be $\boxed{6 \text{ years}}$

Quadratic Equations Ex 8.9 Q7

Answer :

Let the present age of Rehman be x years

Then, 8 years later, age of her $=(x+5)$ years

Five years ago, her age $=(x-3)$ years

Then according to question,

$$\frac{1}{(x-3)}+\frac{1}{(x+5)}=\frac{1}{3}$$

$$\frac{x+5+x-3}{(x-3)(x+5)}=\frac{1}{3}$$

$$\frac{2x+2}{x^2+5x-3x-15}=\frac{1}{3}$$

$$x^2+2x-15=6x+6$$

$$x^2+2x-15-6x-6=0$$

$$x^2-4x-21=0$$

$$x^2-7x+3x-21=0$$

$$x(x-7)+3(x-7)=0$$

$$(x-7)(x+3)=0$$

So, either

$$(x-7)=0$$

$$x=7$$

Or

$$(x+3)=0$$

$$x=-3$$

But the age never be negative

Hence, the present age of Rehman be $=\boxed{7 \text{ years}}$

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