Quadratic Equations Ex 8.7 Q28

Answer :

Let the larger number be x.

Then according to the question,

Square of the smaller number = $8x$, then

$$x^2 - 8x = 180$$
$$\Rightarrow x^2 - 8x - 180 = 0$$
$$\Rightarrow x^2 - 18x + 10x - 180 = 0$$
$$\Rightarrow x(x - 18) + 10(x - 18) = 0$$
$$\Rightarrow (x + 10)(x - 18) = 0$$
$$\Rightarrow x + 10 = 0 \text{ or } x - 18 = 0$$
$$\Rightarrow x = -10 \text{ or } x = 18$$

Since, x being a positive integer so, x cannot be negative,

Therefore, larger number = 18.

then the smaller number = $\sqrt{8 \times 18} = 12$

Thus, the two positive numbers are 12 and 18.

Quadratic Equations Ex 8.7 Q29

Answer :

Let one of the number be x then other number is $(18 - x)$.

Then according to question,

$\frac{1}{x} + \frac{1}{18-x} = \frac{1}{4}$

$\Rightarrow \frac{18-x+x}{x(18-x)} = \frac{1}{4}$

$\Rightarrow 18 \times 4 = 18x - x^2$

$\Rightarrow 72 = 18x - x^2$

$\Rightarrow x^2 - 18x + 72 = 0$

$\Rightarrow x^2 - 12x - 6x + 72 = 0$

$\Rightarrow x\left(x - 12\right) - 6\left(x - 12\right) = 0$

$\Rightarrow \left(x - 6\right)\left(x - 12\right) = 0$

$\Rightarrow x - 6 = 0 \text{ or } x - 12 = 0$

$\Rightarrow x = 6 \text{ or } x = 12$

Since, x being a number,

Therefore,

When $x = 12$ then another number will be

$18 - x = 18 - 12 = 6$

And when $x = 6$ then another number will be

$18 - x = 18 - 6 = 12$

Thus, the two numbers are 6 and 12.

Quadratic Equations Ex 8.7 Q30

Answer :

Given that a and b be two numbers in such a way that $b = (15 - a)$.

Then according to question

$\frac{1}{a} + \frac{1}{b} = \frac{3}{10}$

$\frac{(b+a)}{ab} = \frac{3}{10}$

$\frac{(a+b)}{ab} = \frac{3}{10}$

By cross multiplication

$10a + 10b = 3ab$ .... (1)

Now putting the value of b in equation (1)

$10a + 10(15 - a) = 3a(15 - a)$

$\cancel{10a} + 150 - \cancel{10a} = 45a - 3a^2$

$$3a^2-45a+150=0$$
$$3\left(a^2-15a+50\right)=0$$
$$\left(a^2-15a+50\right)=0$$
$$a^2-10a-5a+50=0$$
$$a(a-10)-5(a-10)=0$$
$$(a-10)(a-5)=0$$
$$(a-10)=0$$
$$a=10$$

Or

$$(a-5)=0$$
$$a=5$$

Therefore,

When $a=10$ then

$$b=15-a=15-10$$
$$=5$$

And when $a=5$ then

$$b=15-a=15-5$$
$$=10$$

Thus, two consecutive number be either $\boxed{a=5,b=10 \text{ or } a=10,b=5}$

Quadratic Equations Ex 8.7 Q31

Answer :

Let one numbers be x then other $(16-x)$.

Then according to question

$$\frac{1}{x}+\frac{1}{(16-x)}=\frac{1}{3}$$

$$\frac{16-\cancel{x}+\cancel{x}}{x(16-x)}=\frac{1}{3}$$

$$\frac{16}{(16x-x^2)}=\frac{1}{3}$$

By cross multiplication

$$48=16x-x^2$$

$$x^2-16x+48=0$$

$$x^2-12x-4x+48=0$$

$$x(x-12)-4(x-12)=0$$

$$(x-12)(x-4)=0$$

$$(x-12)=0$$

$$x=12$$

Or

$$(x-4)=0$$

$$x=4$$

Since, x being a number,

Therefore,

When $x=12$ then

$$16-x=16-12$$

$$=4$$

And when $x=4$ then

$$16-x=16-4$$

$$=12$$

Thus, two consecutive number be either $\boxed{4,12}$

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