

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

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

By cross multiplication

$$10a + 10b = 3ab \dots (1)$$

Now putting the value of b in equation (1)

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

$$10a + 150 - 10a = 45a - 3a^2$$

$$3a^{2}-45a+150=0$$

$$3(a^{2}-15a+50)=0$$

$$(a^{2}-15a+50)=0$$

$$a^{2}-10a-5a+50=0$$

$$a(a-10)-5(a-10)=0$$

$$(a-10)(a-5)=0$$

$$a=10$$
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 a = 5, b = 10 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

Since, x being a number,

Therefore,

(x-4)=0

When x = 12 then

x = 4

$$16 - x = 16 - 12$$

= 4

And when x = 4 then

$$16 - x = 16 - 4$$

= 12

Thus, two consecutive number be either 4,12

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