



Quadratic Equations Ex 8.7 Q24

Answer :

Let the tens digit be x then the unit digits $= \frac{16}{x}$

Therefore, number $= \left(10x + \frac{16}{x}\right)$

And number obtained by interchanging the digits $= \left(10 \times \frac{16}{x} + x\right)$

Then according to question

$$\left(10x + \frac{16}{x}\right) - \left(10 \times \frac{16}{x} + x\right) = 54$$

$$\left(10x + \frac{16}{x}\right) - \left(10 \times \frac{16}{x} + x\right) = 54$$

$$\frac{(10x^2 + 16) - (160 + x^2)}{x} = 54$$

$$\frac{10x^2 + 16 - 160 - x^2}{x} = 54$$

$$\frac{9x^2 - 144}{x} = 54$$

$$9x^2 - 144 = 54x$$

$$9x^2 - 54x - 144 = 0$$

$$9(x^2 - 6x - 16) = 0$$

$$x^2 - 6x - 16 = 0$$

$$x^2 - 8x + 2x - 16 = 0$$

$$x(x - 8) + 2(x - 8) = 0$$

$$(x - 8)(x + 2) = 0$$

$$(x - 8) = 0$$

$$x = 8$$

Or

$$(x + 2) = 0$$

$$x = -2$$

So the digit can never be negative.

Therefore,

When $x = 8$ then the unit digits

$$= \frac{16}{x}$$

$$= \frac{16}{8}$$

$$= 2$$

And the number is

$$= \left(10x + \frac{16}{x} \right)$$

$$= (10 \times 8 + 2)$$

$$= 82$$

Thus, the required number be 82

Answer :

Let two required numbers be x and $(x+3)$

Then according to question

$$x(x+3) = 504$$

$$x^2 + 3x - 504 = 0$$

$$x^2 + 24x - 21x - 504 = 0$$

$$x(x+24) - 21(x+24) = 0$$

$$(x+24)(x-21) = 0$$

$$(x+24) = 0$$

$$x = -24$$

Or

$$(x-21) = 0$$

$$x = 21$$

Since, x being a number,

Therefore,

When $x = -24$ then

$$x+3 = -24+3$$

$$= -21$$

And when $x = 21$ then

$$x+3 = 21+3$$

$$= 24$$

Thus, two consecutive number be either $21, 24$ or $-21, -24$

Answer :

Let two required numbers be x and $(x + 4)$

Then according to question

$$x(x + 4) = 192$$

$$x^2 + 4x - 192 = 0$$

$$x^2 + 16x - 12x - 192 = 0$$

$$x(x + 16) - 12(x + 16) = 0$$

$$(x + 16)(x - 12) = 0$$

$$(x + 16) = 0$$

$$x = -16$$

Or

$$(x - 12) = 0$$

$$x = 12$$

Since, x being a number,

Therefore,

When $x = -16$ then

$$x + 4 = -16 + 4$$

$$= -12$$

And when $x = 12$ then

$$x + 4 = 12 + 4$$

$$= 16$$

Thus, two consecutive number be either 12, 16 or -16, -12

Quadratic Equations Ex 8.7 Q27

Answer :

Let the require digit be $= (10x + y)$

Then according to question

$$(10x + y) = 4(x + y)$$

$$(10x + y) = 4x + 4y$$

$$10x + y - 4x - 4y = 0$$

$$6x - 3y = 0$$

$$2x - y = 0$$

$$2x = y \dots\dots (1)$$

$$\text{And, } (10x + y) = 2xy \dots\dots(2)$$

Now putting the value of y in equation (2) from (1)

$$(10x + 2x) = 2x \times 2x$$

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

$$4x(x - 3) = 0$$

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

*****END*****