Quadratic Equations Ex 8.7 Q16

Answer :

Let one numbers be x then other $(x+4)$.

Then according to question

$$\frac{1}{x}-\frac{1}{(x+4)}=\frac{4}{21}$$

$$\frac{x+4-x}{x(x+4)}=\frac{4}{21}$$

$$\frac{4}{(x^2+4x)}=\frac{4}{21}$$

By cross multiplication

$$4x^2+16x=84$$

$$4x^2+16x-84=0$$

$$4(x^2+4x-21)=0$$

$$(x^2+4x-21)=0$$

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

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

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

$$(x+7)=0$$

$$x=-7$$

Or

$$(x-3)=0$$

$$x=3$$

Since, x being a number,

Therefore,

When $x=-7$ then

$$x+4=-7+4$$

$$=-3$$

And when $x=3$ then

$$x+4=3+4$$

$$=7$$

Thus, two consecutive number be either $\boxed{7,3 \text{ or } -7,-3}$

Quadratic Equations Ex 8.7 Q17

Answer :

Let one natural number be x and other $(x-3)$.

Then according to question

$$(x)^2+(x-3)^2=117$$

$$x^2+x^2-6x+9=117$$

$$2x^2-6x+9-117=0$$

$$2x^2-6x-108=0$$

$$2x^2-6x-108=0$$

$$2(x^2-3x-54)=0$$

$$(x^2-3x-54)=0$$

$$x^2-9x+6x-54=0$$

$$x(x-9)+6(x-9)=0$$

$$(x-9)(x+6)=0$$

$$(x-9)=0$$

$$x=9$$

or

$$(x+6)=0$$

$$x=-6$$

Since, x being a natural number, so x cannot be negative.

Therefore,

When $x=9$ then even integer

$$x-3=9-3$$

$$=6$$

Thus, two natural number be $\boxed{9,6}$

Quadratic Equations Ex 8.7 Q18

Answer :

Let three consecutive integer be $x,(x+1)$ and $(x+2)$

Then according to question

$$x^2+(x+1)^2+(x+2)^2=149$$

$$x^2+x^2+2x+1+x^2+4x+4=149$$

$$3x^2+6x+5-149=0$$

$$3x^2+6x-144=0$$

$$3x^2+6x-144=0$$

$$3\left(x^2+2x-48\right)=0$$

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

$$x^2+8x-6x-48=0$$

$$x(x+8)-6(x+8)=0$$

$$(x+8)(x-6)=0$$

$$(x+8)=0$$

$$x=-8$$

Or

$$(x-6)=0$$

$$x=6$$

Since, x being a positive number, so x cannot be negative.

Therefore,

When $x=6$ then other positive integer

$$x+1=6+1$$

$$=7$$

And

$$x+2=6+2$$

$$=8$$

Thus, three consecutive positive integer be $\boxed{6,7,8}$

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