Quadratic Equations Ex 8.7 Q13

Answer :

Let the successive integer multiples of 5 be $5x$, and $5(x+1)$

Then according to question

$$5x \times 5(x+1) = 300$$
$$25(x^2 + x) = 300$$
$$x^2 + x = 12$$
$$x^2 + x - 12 = 0$$
$$x^2 - 3x + 4x - 12 = 0$$
$$x(x-3) + 4(x-3) = 0$$
$$(x-3)(x+4) = 0$$

Therefore,

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

Or

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

When $x = 3$ then integer

$$5x = 5 \times 3$$
$$= 15$$
$$5(x+1) = 5(3+1)$$
$$= 5 \times 4$$
$$= 20$$

And when $x = -4$ then integer

$$5x = 5 \times -4$$
$$= -20$$
$$5(x+1) = 5(-4+1)$$
$$= 5 \times (-3)$$
$$= -15$$

Thus, three consecutive positive integer be $\boxed{15, 20 \, or - 20, -15}$

Quadratic Equations Ex 8.7 Q14

Answer:

Let the numbers be integers. One of the numbers be x. So, the other will be $(2x-3)$.

Then according to question,

$$x^2 + (2x-3)^2 = 233$$
$$x^2 + 4x^2 - 12x + 9 = 233$$
$$5x^2 - 12x + 9 - 233 = 0$$
$$5x^2 - 12x - 224 = 0$$
$$5x^2 - 40x + 28x - 224 = 0$$
$$5x(x-8) + 28(x-8) = 0$$
$$(x-8)(5x+28) = 0$$
$$(x-8) = 0$$
$$x = 8$$

Or

$$(5x+28) = 0$$
$$x = \frac{-28}{5}$$

Since, we have assumed the numbers to be integers, so x cannot be a rational number/fraction.

Therefore, for $x = 8$

Other number =
$$(2x-3) = 2 \times 8 - 3$$
$$= 16 - 3$$
$$= 13$$

Thus, whole numbers be $\boxed{8,13}$.

Quadratic Equations Ex 8.7 Q15

Answer:

Let two consecutive even integer be $2x$ and other $(2x+2)$

Then according to question

$$(2x)^2 + (2x+2)^2 = 340$$
$$4x^2 + 4x^2 + 8x + 4 = 340$$
$$8x^2 + 8x = 340 - 4$$
$$8x^2 + 8x - 336 = 0$$
$$8x^2 + 8x - 336 = 0$$
$$8(x^2 + x - 42) = 0$$
$$(x^2 + x - 42) = 0$$
$$x^2 + 7x - 6x - 42 = 0$$
$$x(x+7) - 6(x+7) = 0$$
$$(x+7)(x-6) = 0$$
$$(x+7) = 0$$
$$x = -7$$

or

$(x-6)=0$

$x=6$

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

Therefore,

When $x=6$ then even integer

$2x = 2 \times 6$

$= 12$

And

$2x+2 = 2 \times 6 + 2$

$= 14$

Thus, two consecutive odd positive integer be $\boxed{12, 14}$

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