Quadratic Equations Ex 8.2 Q1

Answer:

Since it is given here in the question that the numbers we have to find are consecutive positive integer numbers, therefore the difference between the two numbers should be equal to 1. For e.g. 7 and 8 or 26 and 27 are consecutive numbers.

Let us assume the first number to be 'x'. So our next consecutive number should be '$x+1$'. Now the question also says that the product of these two numbers is 306.

Therefore,

$$(x)(x+1) = 306$$
$$x^2 + x = 306$$
$$x^2 + x - 306 = 0$$

Hence, this is our required quadratic equation.

Quadratic Equations Ex 8.2 Q2

Answer:

It is given that John had 'x' marbles. We are also given that both John and Javanti had 45 marbles together. So, Javanti should have '$45 - x$' marbles with her. Now it is given that both of them loose 5 marbles each. So in the new situation, John will have '$x - 5$' marbles and Javanti will have '$45 - x - 5$' marbles. Also it is given that the product of the number of marbles both of them now is 128. This means that the product of '$x - 5$' and '$45 - x - 5$' should be equal to 128.

Therefore,

$$(x-5)(45-x-5) = 128$$
$$(x-5)(40-x) = 128$$
$$40x - x^2 - 200 + 5x = 128$$
$$x^2 - 45x + 200 + 128 = 0$$
$$x^2 - 45x + 328 = 0$$

Hence, this is the required quadratic equation.

Quadratic Equations Ex 8.2 Q3

Answer:

Now we know that 'x' denotes the total number of toys produced in that day. But, the cost of production of a single toy is 55 minus the number of toys produced that day i.e. 'x'. So the total production cost would be the product of the cost of a single toy and the total number of toys i.e. product of '$55-x$' and 'x'. Now, it is given here that total production cost of that day was Rs.750.

Therefore,

$$(x)(55-x) = 750$$
$$55x - x^2 = 750$$
$$x^2 - 55x + 750 = 0$$

Hence, this is the required quadratic equation.

Quadratic Equations Ex 8.2 Q4

Answer:

Now, since we have to find out base, let us assume the base to be 'x' cm. Therefore the height of the triangle becomes '$x-7$'. It is also given that the hypotenuse is 13 cm. Now we know that in a right triangle the sum of the square of the base and height is equal to the square of the hypotenuse which is called as the Pythagoras Theorem. Now, we will apply this theorem in this question.

So, the equation is formed as

$$x^2 + (x-7)^2 = (13)^2$$
$$x^2 + x^2 + 49 - 14x = 169$$
$$2x^2 - 14x - 120 = 0$$
$$x^2 - 7x - 60 = 0$$

Hence, this is our required quadratic equation.

Quadratic Equations Ex 8.2 Q5

Answer :

Now let us assume that the speed of the express train be '*x*' km/hr. Therefore according to the question speed of the passenger train will be '*x*-11' km/hr. Now we know that the total distance travelled by both the trains was 132 km.
We also know that

So the time taken by express train would be $\left(\dfrac{132}{x}\right)$ and the time taken by the passenger train would be

$\left(\dfrac{132}{x-11}\right)$. Now, we also know that the express train took 1 hr less than the passenger train to travel the whole distance.
Therefore, we have

$$\left(\frac{132}{x}\right)=\left(\frac{132}{x-11}\right)-1$$
$$\left(\frac{132}{x-11}\right)-\left(\frac{132}{x}\right)=1$$
$$\left(\frac{132x-132(x-11)}{x^2-11x}\right)=1$$
$$x^2-11x-1452=0$$

Therefore, this is the required equation.

Quadratic Equations Ex 8.2 Q6

Answer :

Let us assume that the speed of the train be '*x*' km/hr. We are also given that the distance covered during the journey is 360 km.

Now, time taken during original journey = $\left(\dfrac{360}{x}\right)$ hr

We also know, time taken for the new journey = $\left(\dfrac{360}{x+5}\right)$ hr

Now according to the question, the difference between these two journeys is 1 hr.
Therefore,

$$\left(\frac{360}{x}\right)-\left(\frac{360}{x+5}\right)=1$$
$$\left(\frac{360x+1800-360x}{x^2+5x}\right)=1$$
$$x^2+5x=1800$$
$$x^2+5x-1800=0$$

Hence, this is the required quadratic equation.

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