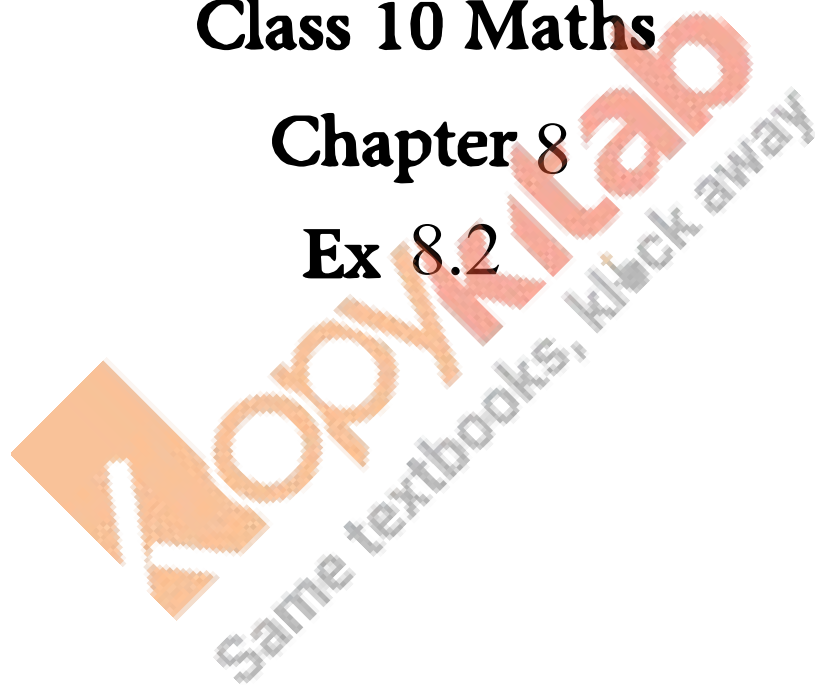# RD SHARMA

## Solutions

## Class 10 Maths

## Chapter 8

## Ex 8.2

**Question 1: The product of two consecutive positive integers is 306. Form the quadratic equation to find the integers, if x denotes the smaller integer.**

**Solution:**

Given that the smallest integer of 2 consecutive integers is denoted by x

The two integers be x and x+1

According to the question, the product of the integers is 306

Now,

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

The required quadratic equation of the equation is $x^2+x-306=0$

**Question 2: John and Jivani together have 45 marbles. Both of them lost 5 marbles each, and the product of the number of marbles they now have is 128. Form the quadratic equation to find how many marbles they to start with if John had x marbles.**

**Solution:**

Given that John and Jilani are having the total of 45 marbles.

Let us consider John is having x marbles

Jivani is having (45-x) marbles.

Number of marbles john had after losing 5 marbles = x-5

Number of marbles jivani had after losing 5 marbles = (45-x)-5 = 40-x

According to the question the product of the marbles that they are having now is 128

Now, (x-5)(40-x) = 128

$= 40x-x^2-200 = 128$

$= x^2 -45x+128+200 =0$

$= x^2 -45x+328 = 0$

The required quadratic equation is $x^2 -45x+328 = 0$.

**Question 3: A cottage industry produces a certain number of toys in a day. The cost of production of each toy was found to be 55 minutes the number of articles produced in a day.**

**On a particular day , the total cost of production was Rs. 750. If x denotes the number of toys produced that day, form the quadratic equation to find x.**

**Solution:**

Given

(y) Denotes the number of toys produced in a day.

The cost of production of each toy = (55 – y)

Total cost of production is nothing but the product of number of toys produced in a day and cost of production of each toy = y (55-y)

According to the question

The total cost of production is Rs.750

= y (55-y) = 750

= $55y-y^2$ = 750

= $y^2$ -55y+750= 0

The required quadratic equation of the given data is $y^2$ -55y+750= 0.

**Question 4: The height of the right triangle is 7 cm less than its base. If the hypotenuse is 13cm, form the quadratic equation to find the base of the triangle.**

**Solution:**

According to the question

The hypotenuse of the triangle = 13 cm

Let the base of the triangle = x cm

So, the height of the triangle = (x-7) cm

Applying Pythagoras theorem in the right angled triangle, we get,

$(Base)^2$ + $(height)^2$ = $(hypotenuse)^2$

$X^2$ +$(x-7)^2$ = $(13)^2$

$X^2$ + $x^2$ + 49 -14x =169

$2x^2$ -14x -120 =0

$2(x^2 -7x -60) =0$

$x^2 -7x -60 =0$

The required quadratic equation is $x^2 -7x -60 =0$

**Question 5: The average speed of the express train is 11 km/hr more than that of the passenger train. The total distance covered by the train is 132 km. Also, time taken by the express train is 1 hour is less than that of the passenger train. Find the quadratic equation of this problem.**

**Solution:**

Let the average speed of the express train be = x km /hr

Given, the average speed of the express train is 10 km/ hr less than that of passenger train = (x-11) km/hr

We know that:

Time taken for travel = distance travelled / average speed

Time taken for express train = distance travelled / average speed of the express train

$= 132x\frac{132}{x}$

Hence time taken by the passenger train = $132x{-}11\frac{132}{x-11}$

According to the question,

Time taken by the express train is 1 hour less than that of passenger train

Time taken by passenger train – time taken by express train = 1 hour

$132x{-}11\frac{132}{x-11} - 132x\frac{132}{x} = 1$

$132(1x{-}11 - 1x)132(\frac{1}{x-11} - \frac{1}{x}) =1$

$132(x{-}(x{-}11)x{\times}(x{-}11))132(\frac{x-(x-11)}{x\times(x-11)}) =1$

$132(x{-}x{+}11x^2{-}11x)132(\frac{x-x+11}{x^2-11x}) = 1$

$132(11x^2{-}11x)132(\frac{11}{x^2-11x}) = 1$

$1452 = x^2 {-}11x$

$X^2 -11x - 1452 = 0$

The quadratic equation of the given problem is $X^2 - 11x - 1452 = 0$.

**Question 6: A train travels 360 km at a uniform speed. If the speed had been 5 km/ hr more, it would have taken 1 hour less for the same journey. Form the quadratic equation to find the speed of the train.**

**Solution:**

Let the speed of the train be = x km /hr

Distance travelled by the train = 360 km

We know that,

Time taken for travel = distance travelled ÷ speed of the train

$= 360x \frac{360}{x}$

If the speed of the train is increased by 4 km /hr then time taken $= 360x+5 \frac{360}{x+5}$

According to the question,

The time of travel is reduced by 1 hour when the speed of the train is increased by 5 km /hr

$360x \frac{360}{x} - 360x+5 \frac{360}{x+5} = 1$

$360(1x - 1x+5)360(\frac{1}{x} - \frac{1}{x+5}) = 1$

$360(x+5-xx(x+5))360(\frac{x+5-x}{x(x+5)}) = 1$

$360(5x(x+5))360(\frac{5}{x(x+5)}) = 1$

$360(5x^2+5x)360(\frac{5}{x^2+5x}) = 1$

$X^2 + 5x = 1800$

The required quadratic equation is $X^2 + 5x - 1800 = 0$.