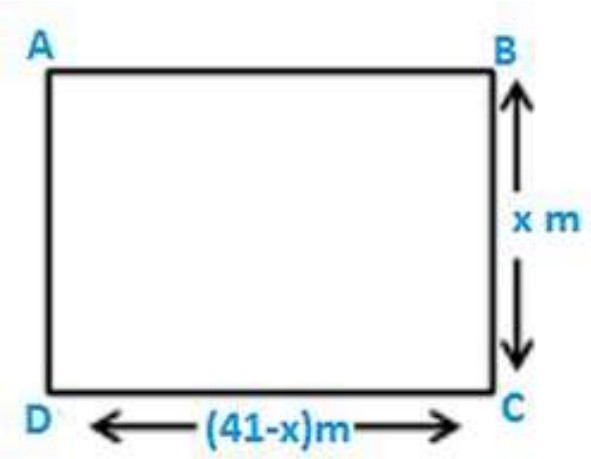
RD SHARMA

Solutions
Class 10 Maths

Chapter 8

Ex 8.11

Question 1:



The perimeter of the rectangular field is 82m and its area is 400m^2.find the breadth of the rectangle?

Soln:

Let the breadth of the rectangle be (x) m

Given,

Perimeter = 82 m

Area = 400 m^2

Perimeter of a rectangle = 2(length + breadth)

82=2(length + x)

41 = (length + x)

Length = (41-x) m

We know,

Area of the rectangle = length * breadth

400 = (41-x) (x)

400 = 41x-x^2

= x^2-41x+400 = 0

= x^2-25x-16x+400 = 0

= x(x-25)-16(x-25) =0

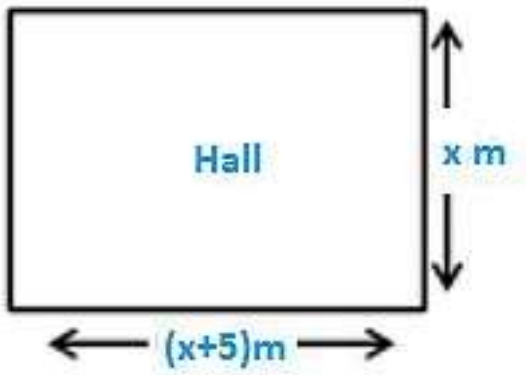
= (x-16)(x-25) =0

Either x-16 =0 therefore x=16

Or, x-25=0 therefore x =25

Hence the breadth of the above mentioned rectangle is either 16 m or 25 m respectively.

Question 2:



The length of the hall is 5 m more than its breadth. If the area of the floor of the hall is 84 m^2 , what is the length and breadth of the hall?

Soln:

Le the breadth of the rectangle be x m

Let the length of the hall is 5 m more than its breadth =(x+5) m

Also given that,

Area of the hall is = 84 m^2

The shape of the hall is rectangular

Area of the rectangular hall = length * breadth

84 = x(x+5)

= x^2+5x-84 =0

= x^2+12x-7x-84 =0

= x(x+12)-7(x+12) =0

= (x+12)(x-7) =0

Either x+12 =0 therefore x = -12

Or, x-7 =0 therefore x =7

Since the value of x cannot be negative

So x = 7

= x+5 = 12

The length and breadth of the rectangle is 7 and 12 respectively.

Question 3: Two squares have sides x and (x+4) cm. The sum of their area is 656 cm^2 . Find the sides of the square.

Soln:

Let S_1 and S_2 be the two square

Let x cm be the side square S_1 and (x+4) cm be the side of the square S_2 .

Area of the square $S_1 = x^2$ cm^2

Area of the square $S_2 =(x+4)^2$ cm^2

According to the question,

Area of the square S_1 + Area of the square S_2 = 656 cm^2

$= x^2$ $cm^2 + (x+4)^2$ cm^2 = 656 cm^2

$= x^2+ x^2+16+8x-656 =0$

$=2 x^2+16+8x-656 =0$

$= 2 (x^2+4x-320) =0$

$= x^2+4x-320 =0$

$= x^2+20x-16x-320 =0$

= x(x+20)-16(x+20) =0

= (x+20)(x-16) =0

Either x+20 = 0 therefore x = -20

Or, x-16 =0 therefore x =16

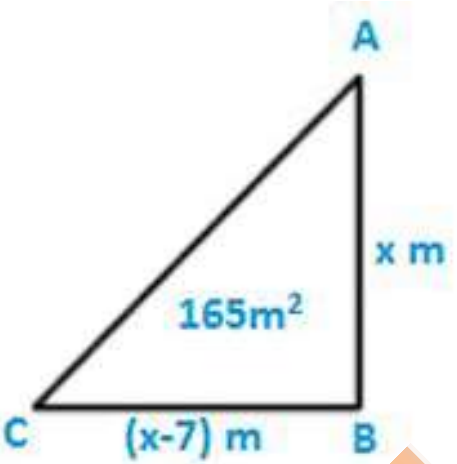
Since the value of x cannot be negative so the value of x = 16

The side of the square S_1= 16 cm

The side of the square S_2 = 20 cm

Question 4: The area of the right-angled triangle is 165 cm^2. Determine the base and altitude if the latter exceeds the former by 7m.

Soln:



Let the altitude of the right angles triangle be denoted by x m

Given that the altitude exceeds the base by 7 m = x-7 m

We know

Area of the triangle = $12 \times base \times altitude \frac{1}{2} \times \text{base} \times \text{altitude}$

= 165 = $12 \times (x-7) \times x \frac{1}{2} \times (x-7) \times x$

= x(x-7) = 330

= x^2-7x-330 =0

= x^2-22x+15x-330 =0

= x(x-22)+15(x-22) =0

= (x-22)(x+15) =0

Either x-22 =0 therefore x =22

Or, x+15 =0 therefore x =-15

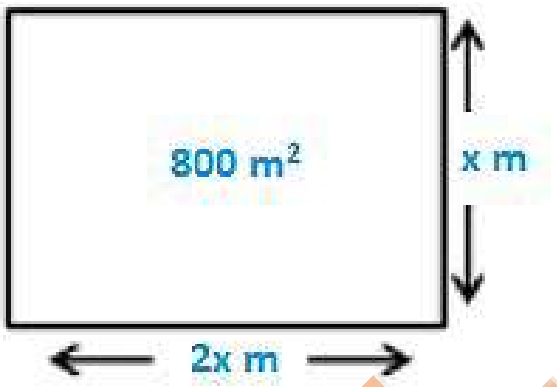
Since the value of x cannot be negative so the value of x = 22

=x-7 = 15

The base and altitude of the right angled triangle are 15 cm and 22 cm respectively.

Question 5: Is it possible to design a rectangular mango grove whose length is twice its breadth and area is 800 m^2 .find its length and breadth.

Soln:



Let the breadth of the rectangular mango grove be x m

Given that length of rectangle is twice of its breadth

Length = 2x

Area of the grove = 800 m^2

We know,

Area of the rectangle = length * breadth

= 800 = x(2x)

= $2x^2$-800 =0

= x^2-400 =0 = x^2=400 = x=$\sqrt{400}$=20$x = \sqrt{400} = 20$

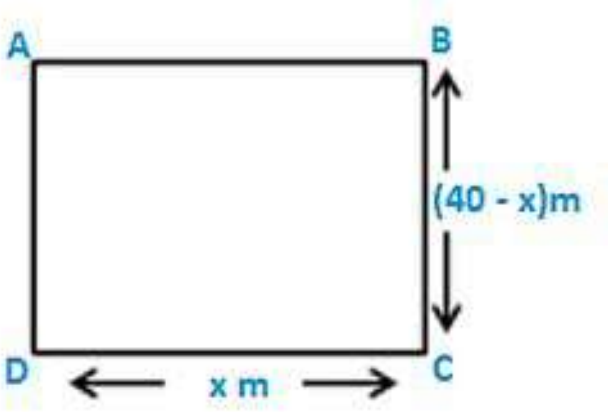
Breadth of the rectangular groove is 20 m

Length of the rectangular groove is 40 m

Yes, it is possible to design a rectangular groove whose length is twice of its breadth.

Question 6: Is it possible to design a rectangular park of perimeter 80 m and area 400 m^2? If so find its length and breadth.

Soln:



In order to prove the given condition let us assume that the length of the rectangular park is denoted by x m

Given that,

Perimeter = 8 cm

Area = 400 cm^2

Perimeter of the rectangle = 2(length +breadth)

80 = 2(x + breadth)

Breadth = (40-x) m

We know,

Area of the rectangle = (length) (breadth)

= 400 = x(40-x)

= $40x-x^2=400$

= $x^2-40x+400=0$

= $x^2-20x-20x+400=0$

= x(x-20)-20(x-20) =0

= (x-20)(x-20) =0

= $(x-20)^2$ =0

= x-20 = 0 therefore x=20

Length of the rectangular park is = 20 m

Breadth of the rectangular park =(40-x) = 20 m

Yes, it is possible to design a rectangular Park of perimeter 80 m and area 400m^2

Question 7: Sum of the area of the square is 640 m^2.if the difference of their perimeter is 64 m, find the sides of the two squares.

Soln:

Let the two squares be S_1 and S_2 respectively. let he sides of the square S_1 be x m and the sides of the square S_2 be y m

Given that the difference of their perimeter is 64 m

We know that the

Perimeter of the square = 4(side)

Perimeter of the square S_1 = 4x m

Perimeter of the square S_2 = 4y m

Now, difference of their perimeter is 64 m

=4x-4y =64

x-y = 16

x = y +16

Also, given that the sum of their two areas

= area of the square 1 +area of the square 2

= 640 = x^2+ y^2

= 640 = $(y+16)^2$+ y^2

= $2y^2$+32y+256-640 =0

= $2y^2$+32y-384 =0

$= 2(y^2+16y-192) = 0$

$= y^2+16y-192 = 0$

$= y^2+24y-8y-192 = 0$

$= y(y+24)-8(y+24) = 0$

$= (y+24)(y-8) = 0$

Either $y+24 = 0$ therefore $y = -24$

Or, $y-8 = 0$ therefore $y=8$

Since the value of y cannot be negative so $y = 8$

Side of the square 1 = 8 m

Side of the square 2 = 8+16 = 24 m

The sides of the squares 1 and 2 are 8 and 24 respectively.