RD Sharma Solutions Class 9 Maths Chapter 12: In Chapter 12 of RD Sharma's Class 9 Maths book, students learn about Heron's Formula, which helps find the area of a triangle using its sides. These solutions help students understand difficult concepts in an easy way. With RD Sharma Solutions, students can learn how to find the area of a triangle using its side lengths. These solutions explain things in a simple manner, making it easier for students to understand. By using these solutions, students can get better at math and do well in their studies.

For students looking for help, RD Sharma's Solutions are a great option. They explain each step clearly and are designed to match students' abilities. You can get the solutions for Chapter 12 of Class 9 Maths for free in PDF format by clicking the links below. These solutions are based on the latest CBSE syllabus for the 2024-25 exams.

RD Sharma Solutions Class 9 Maths Chapter 12 Herons Formula PDF

You can find the PDF link for RD Sharma Solutions Class 9 Maths Chapter 12 on Heron's Formula below. This PDF contains detailed explanations and solutions to help you understand the concepts better.

RD Sharma Solutions Class 9 Maths Chapter 12 Herons Formula PDF

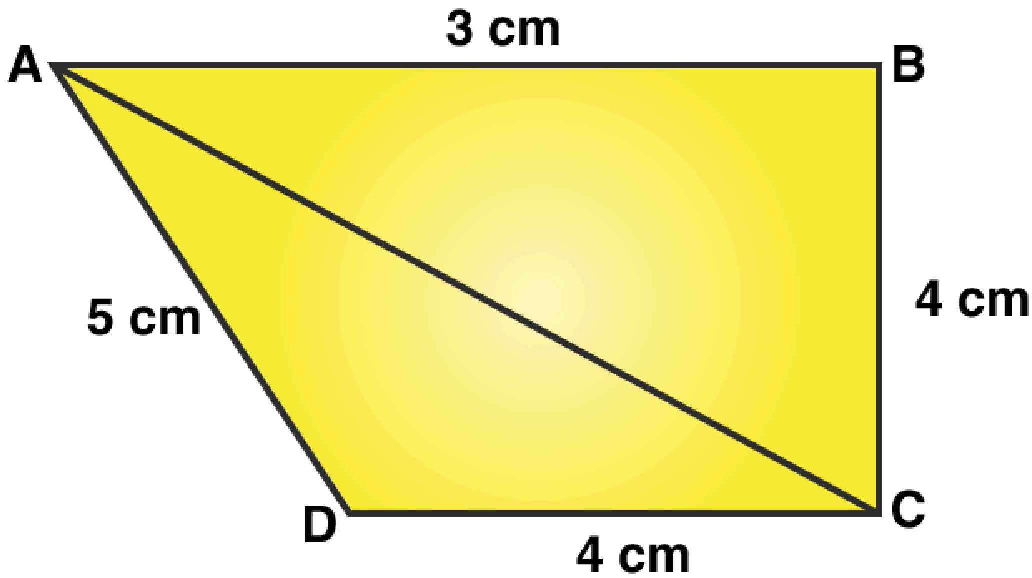
RD Sharma Solutions Class 9 Maths Chapter 12 Herons Formula

The solutions for RD Sharma Class 9 Maths Chapter 12 on Heron's Formula are available below. These solutions are made to help you understand the concepts better. If you're having trouble with calculating triangle areas or other math problems, these solutions provide easy-to-follow explanations.

RD Sharma Solutions Class 9 Maths Chapter 12 Herons Formula Page No: 12.19

Question 1: Find the area of the quadrilateral ABCD in which AB = 3 cm, BC = 4 cm, CD = 4 cm, DA = 5 cm and AC = 5 cm.

Solution:



Area of the quadrilateral ABCD = Area of △ABC + Area of △ADC ….(1)

△ABC is a right-angled triangle, which is right-angled at B.

Area of △ABC = 1/2 x Base x Height

= 1/2×AB×BC

= 1/2×3×4

= 6

Area of △ABC = 6 cm^2 ……(2)

Now, In △CAD,

Sides are given, apply Heron’s Formula.

Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

Semi Perimeter, s = $\frac{(a+b+c)}{2}$

Where, a, b and c are sides of a triangle

Perimeter = 2s = AC + CD + DA

2s = 5 cm + 4 cm + 5 cm

2s = 14 cm

s = 7 cm

Area of the △CAD = 9.16 cm^2 …(3)

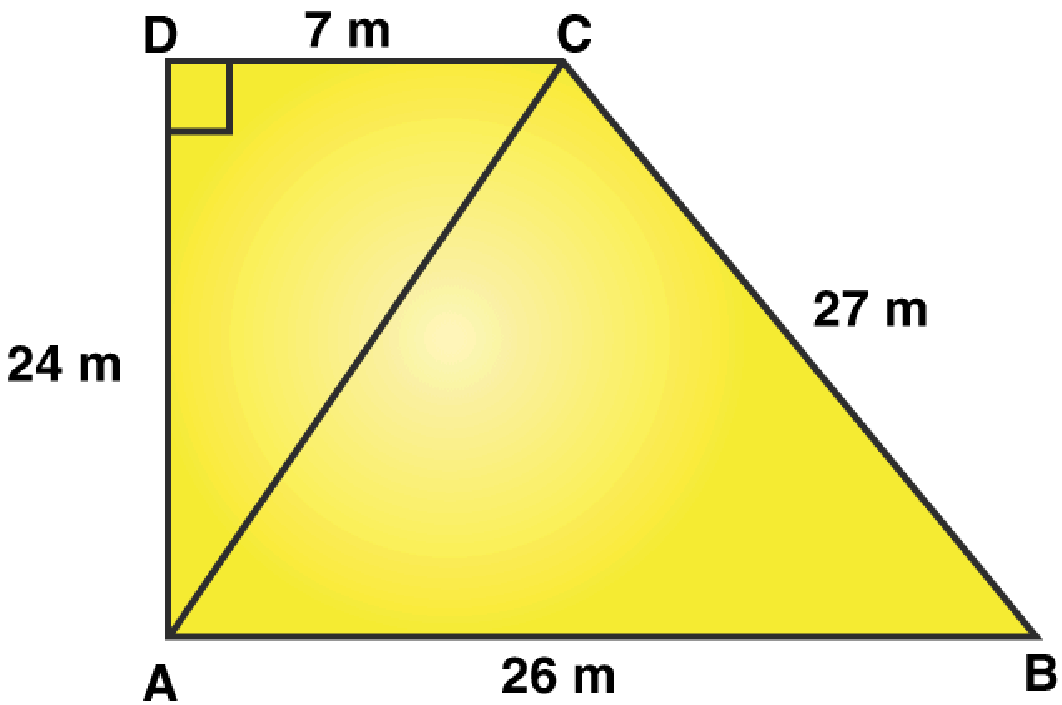
Using equations (2) and (3) in (1), we get

Area of quadrilateral ABCD = (6 + 9.16) cm^2

= *15.16* cm^2.

Question 2: The sides of a quadrilateral field, taken in order, are 26 m, 27 m, 7 m, and 24 m, respectively. The angle contained by the last two sides is a right angle. Find its area.

Solution:



Here,

AB = 26 m, BC = 27 m, CD = 7 m, DA = 24 m

AC is the diagonal joined at A to C point.

Now, in △ADC,

From Pythagoras theorem,

$AC^2 = AD^2 + CD^2$

$AC^2 = 14^2 + 7^2$

AC = 25

Now, area of △ABC

All the sides are known, Apply Heron's Formula.

Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

Semi Perimeter, s = $\frac{(a+b+c)}{2}$

Where, a, b and c are sides of a triangle

Perimeter of △ABC= 2s = AB + BC + CA

2s = 26 m + 27 m + 25 m

s = 39 m

Area of a triangle = $\sqrt{39 \times (39-25) \times (39-26) \times (39-27)}$

= $\sqrt{39 \times 14 \times 13 \times 12}$

= $\sqrt{85176}$

= 291.84

Area of a triangle ABC = 291.84 m^2

Now, for the area of △ADC, (Right angle triangle)

Area = 1/2 x Base X Height

= 1/2 x 7 x 24

= 84

Thus, the area of a △ADC is 84 m^2

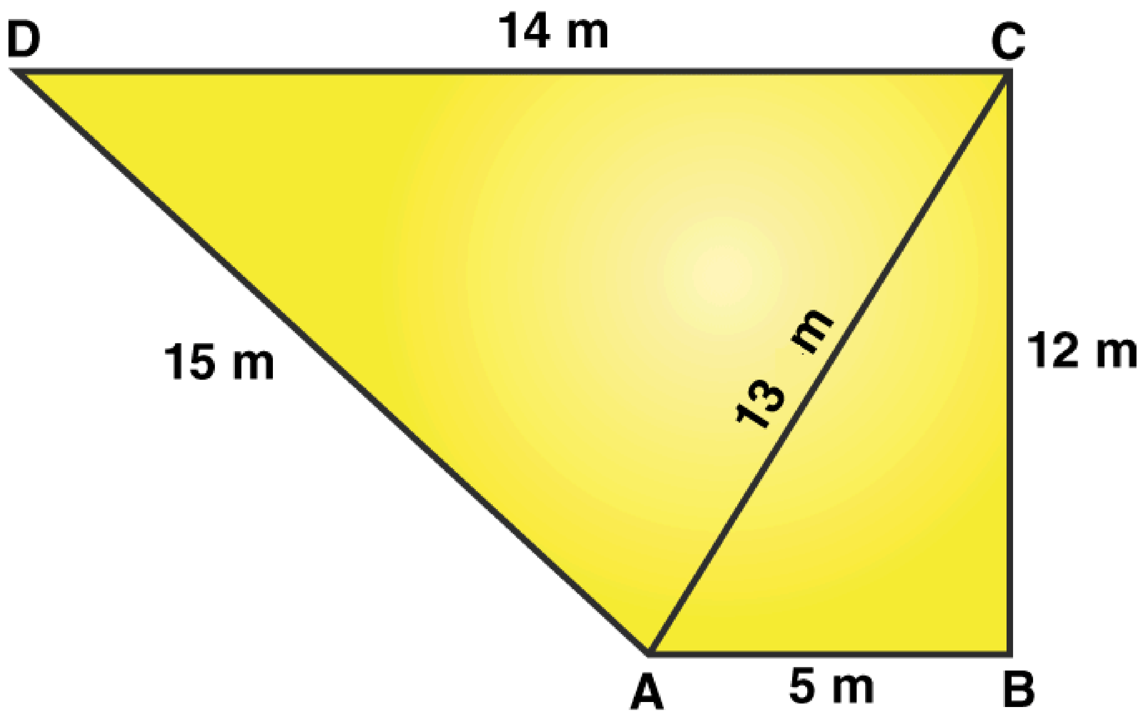
Therefore, the area of rectangular field ABCD = Area of △ABC + Area of △ADC

= 291.84 m^2 + 84 m^2

= *375.8* m^2

Question 3: The sides of a quadrilateral, taken in order as 5, 12, 14, and 15 meters, respectively, and the angle contained by the first two sides is a right angle. Find its area.

Solution:



Here, AB = 5 m, BC = 12 m, CD =14 m and DA = 15 m

Join the diagonal AC.

Now, the area of △ABC = 1/2 ×AB×BC

= 1/2×5×12 = 30

The area of △ABC is 30 m^2

In △ABC, (right triangle).

From Pythagoras theorem,

$AC^2 = AB^2 + BC^2$

$AC^2 = 5^2 + 12^2$

$AC^2 = 25 + 144 = 169$

or AC = 13

Now in △ADC,

All sides are known, apply Heron’s Formula:

Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

Semi Perimeter, s = $\frac{(a+b+c)}{2}$

Where, a, b and c are sides of a triangle

Perimeter of △ADC = 2s = AD + DC + AC

2s = 15 m +14 m +13 m

s = 21 m

= 84

Area of △ADC = 84 m^2

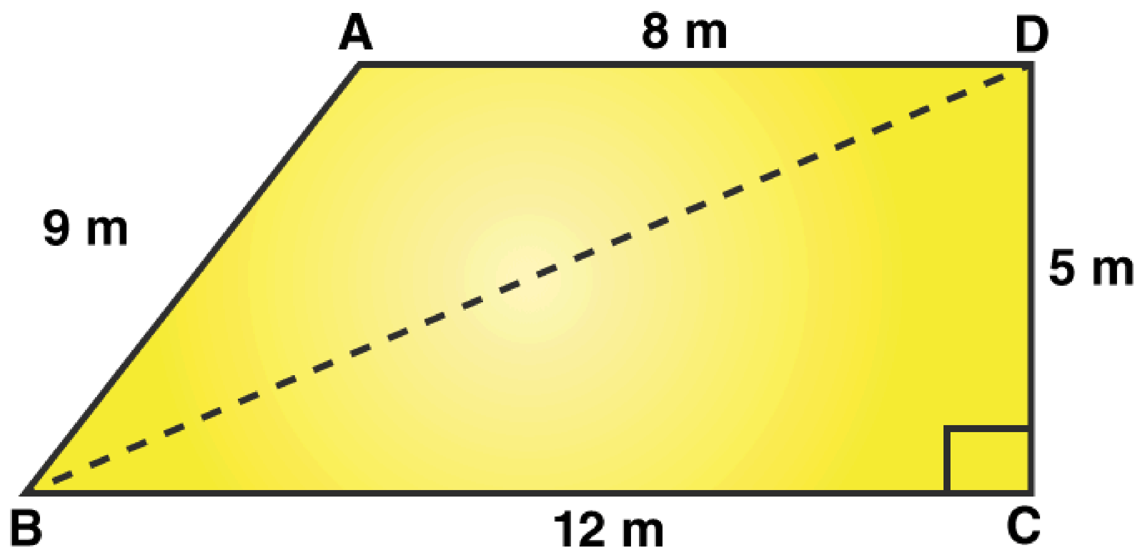
Area of quadrilateral ABCD = Area of △ABC + Area of △ADC

= (30 + 84) m^2

= *114* m^2

Question 4: A park in the shape of a quadrilateral ABCD has ∠ C = 90^0, AB = 9 m, BC = 12 m, CD = 5 m, AD = 8 m. How much area does it occupy?

Solution:



Here, AB = 9 m, BC = 12 m, CD = 5 m, DA = 8 m.

And BD is a diagonal of ABCD.

In the right △BCD,

From Pythagoras theorem;

$BD^2 = BC^2 + CD^2$

$BD^2 = 12^2 + 5^2 = 144 + 25 = 169$

BD = 13 m

Area of △BCD = 1/2×BC×CD

= 1/2×12×5

= 30

Area of △BCD = 30 m^2

Now, In △ABD,

All sides are known, Apply Heron's Formula:

Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

Semi Perimeter, s = $\frac{(a+b+c)}{2}$

Where, a, b and c are sides of a triangle

Perimeter of △ABD = 2s = 9 m + 8m + 13m

s = 15 m

= 35.49

Area of the △ABD = 35.49 m^2

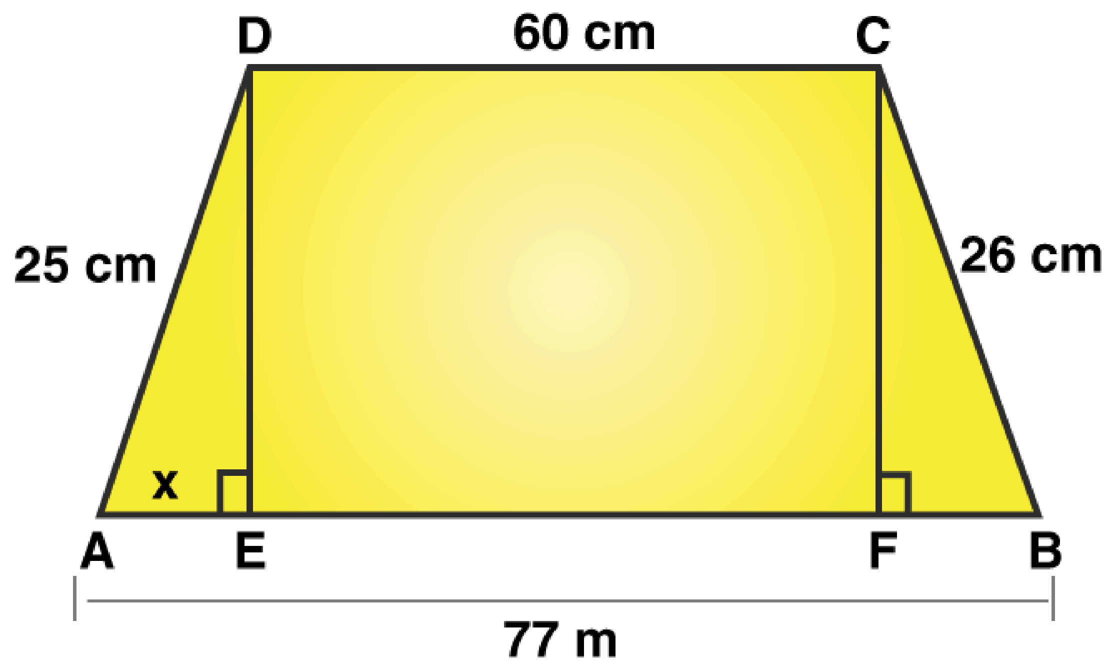
Area of quadrilateral ABCD = Area of △ABD + Area of △BCD

= (35.496 + 30) m^2

= *65.5*m^2.

Question 5: Two parallel sides of a trapezium are 60 m and 77 m and the other sides are 25 m and 26 m. Find the area of the trapezium.

Solution:



Given: AB = 77 m , CD = 60 m, BC = 26 m and AD = 25m

AE and CF are diagonals.

DE and CF are two perpendiculars on AB.

Therefore, we get, DC = EF = 60 m

Let's say, AE = x

Then BF = 77 – (60 + x)

BF = 17 – x …(1)

In the right △ADE,

From Pythagoras theorem,

$DE^2 = AD^2 - AE^2$

$DE^2 = 25^2 - x^2$ ….(2)

In right △BCF

From Pythagoras theorem,

$CF^2 = BC^2 - BF^2$

$CF^2 = 26^2 - (17-x)^2$

[Uisng (1)]

Here, DE = CF

So, $DE^2 = CF^2$

(2) ⇒ $25^2 - x^2 = 26^2 - (17-x)^2$

$625 - x^2 = 676 - (289 - 34x + x^2)$

$625 - x^2 = 676 - 289 + 34x - x^2$

238 = 34x

x =7

(2) ⇒ $DE^2 = 25^2 - (7)^2$

$DE^2 = 625-49$

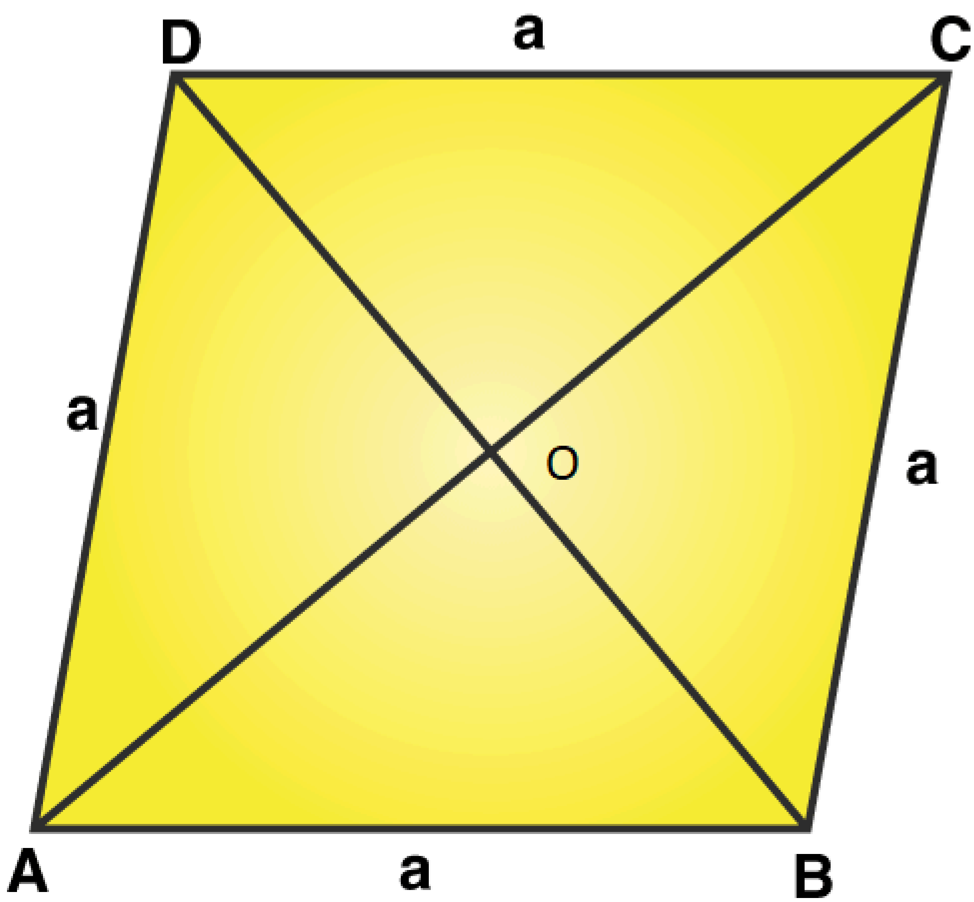
DE = 24

Area of trapezium = 1/2×(60+77)×24 = 1644

Area of trapezium is 1644 m^2 (Answer)

Question 6: Find the area of a rhombus whose perimeter is 80 m and one of whose diagonal is 24 m.

Solution:



The perimeter of a rhombus = 80 m (given)

We know, Perimeter of a rhombus = 4×side

Let a be the side of a rhombus.

4×a = 80

or a = 20

One of the diagonal, AC = 24 m (given)

Therefore OA = 1/2×AC

OA = 12

In △AOB,

Using Pythagoras theorem:

$OB^2 = AB^2 - OA^2 = 20^2 - 12^2 = 400 - 144 = 256$

or OB = 16

Since the diagonal of the rhombus bisect each other at 90 degrees.

And OB = OD

Therefore, BD = 2 OB = 2 x 16 = 32 m

Area of rhombus = 1/2×BD×AC = 1/2×32×24 = 384

Area of rhombus = 384 m^2.

Question 7: A rhombus sheet, whose perimeter is 32 m and whose diagonal is 10 m long, is painted on both the sides at the rate of Rs 5 per m^2**. Find the cost of painting.**

Solution:

The perimeter of a rhombus = 32 m

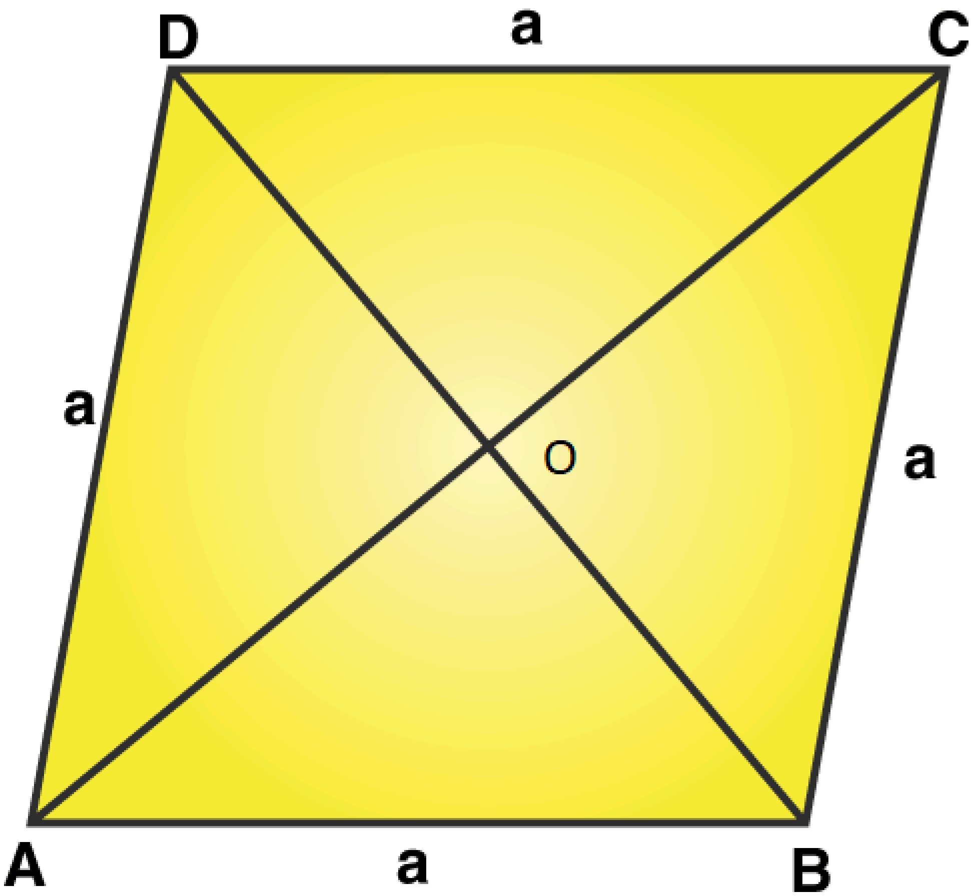
We know, Perimeter of a rhombus = 4×side

⇒ 4×side = 32

side = a = 8 m

Each side of the rhombus is 8 m

AC = 10 m (Given)



Then, OA = 1/2×AC

OA = 1/2×10

OA = 5 m

In right triangle AOB,

From Pythagoras theorem;

$OB^2 = AB^2 – OA^2 = 8^2 – 5^2 = 64 – 25 = 39$

OB = √39 m

And, BD = 2 x OB

BD = 2√39 m

Area of the sheet = 1/2×BD×AC = 1/2 x (2√39 × 10) = 10√39

The area of the sheet is $10\sqrt{39}$ m^2

Therefore, the cost of printing on both sides of the sheet, at the rate of Rs. 5 per m^2

= Rs. 2 x ($10\sqrt{39}$ x 5) = *Rs. 625.*

RD Sharma Solutions Class 9 Maths Chapter 12 Herons Formula Exercise VSAQs Page No: 12.23

Question 1: Find the area of a triangle whose base and altitude are 5 cm and 4 cm, respectively.

Solution:

Given: Base of a triangle = 5 cm and altitude = 4 cm

Area of triangle = 1/2 x base x altitude

= 1/2 x 5 x 4

= 10

The area of the triangle is 10 cm^2.

Question 2: Find the area of a triangle whose sides are 3 cm, 4 cm and 5 cm, respectively.

Solution:

Given: Sides of a triangle are 3 cm, 4 cm and 5 cm, respectively

Apply Heron's Formula:

Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

Semi Perimeter, s = $\frac{(a+b+c)}{2}$

Where, a, b and c are sides of a triangle

S = (3+4+5)/2 = 6

Semi perimeter is 6 cm

Now,

$$\text{Area} = \sqrt{6 \times (6-3) \times (6-4) \times (6-5)}$$

$$= \sqrt{6 \times 3 \times 2 \times 1}$$

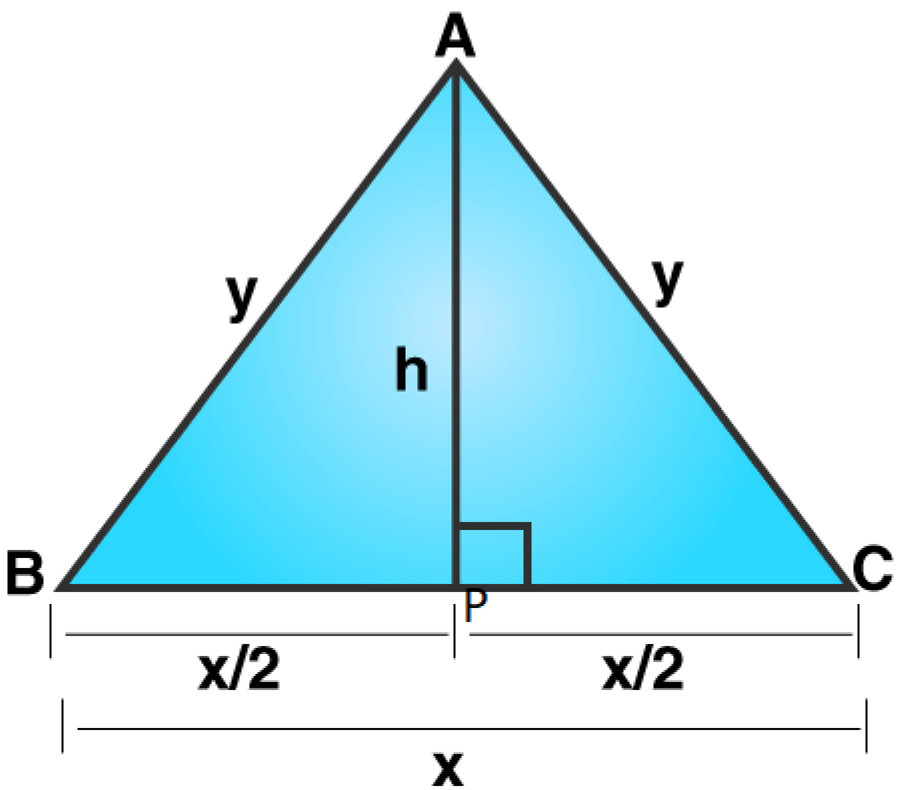
$$= \sqrt{36}$$

= 6

The area of the given triangle is 6 cm^2.

Question 3: Find the area of an isosceles triangle having the base x cm and one side y cm.

Solution:



In right triangle APC,

Using Pythagoras theorem,

$AC^2 = AP^2 + PC^2$

$y^2 = h^2 + (x/2)^2$

or $h^2 = y^2 – (x/2)^2$

or $h = \sqrt{y^2 - x^2/4}$

Now, Area = 1/2 x Base x Height

$= 1/2 \times x (\sqrt{y^2 - x^2/4})$

$= x/4 \sqrt{4y^2 - x^2}$

Question 4: Find the area of an equilateral triangle having each side 4 cm.

Solution: Each side of an equilateral triangle = a = 4 cm

Formula for Area of an equilateral triangle = $(\sqrt{3}/4) \times a^2$

$= (\sqrt{3}/4) \times 4^2$

$= 4\sqrt{3}$

The area of an equilateral triangle is $4\sqrt{3}$ cm^2.

Question 5: Find the area of an equilateral triangle having each side x cm.

Solution:

Each side of an equilateral triangle = a = x cm

Formula for Area of an equilateral triangle = $(\sqrt{3}/4) \times a^2$

$= (\sqrt{3}/4) \times x^2$

$= x^2 \sqrt{3}/4$

The area of an equilateral triangle is $\sqrt{3}x^2/4$ cm^2.