

Important Questions for Class 9 Maths Chapter 12: Here are the Important Questions for Class 9 Maths Chapter 12 Heron's Formula focus on the application of the formula to find the area of triangles when the lengths of all three sides are known.

Practicing these important questions helps students develop problem-solving skills and enhances their ability to apply the formula in various contexts. Working through these problems prepares students for exams by familiarizing them with different types of questions related to Heron's Formula ensuring a solid grasp of the concepts involved.

Important Questions for Class 9 Maths Chapter 12 Overview

These important questions for Class 9 Maths Chapter 12 Heron's Formula are created by subject experts of Physics Wallah.

By working through these questions students can build confidence in their abilities and enhance their problem-solving skills which are important for success in mathematics.

Important Questions for Class 9 Maths Chapter 12 PDF

The PDF link for Important Questions for Class 9 Maths Chapter 12 Heron's Formula is available below.

By accessing the PDF students can conveniently review a variety of problems that reinforce their understanding of how to calculate the area of triangles using this formula. It is a valuable resource for enhancing exam preparation and boosting confidence in tackling related mathematical challenges.

Important Questions for Class 9 Maths Chapter 12 PDF

Important Questions with Solutions for CBSE Class 9 Maths Chapter 12 Heron's Formula

Below we have provided Important Questions with Solutions for CBSE Class 9 Maths Chapter 12 Heron's Formula-

Q.1: Find the area of a triangle whose two sides are 18 cm and 10 cm and the perimeter is 42cm.

Solution:

Assume that the third side of the triangle to be "x".

Now, the three sides of the triangle are 18 cm, 10 cm, and “x” cm

It is given that the perimeter of the triangle = 42cm

So, $x = 42 - (18 + 10) \text{ cm} = 14 \text{ cm}$

\therefore The semi perimeter of triangle = $42/2 = 21 \text{ cm}$

Using Heron’s formula,

Area of the triangle,

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

$$= \sqrt{21(21 - 18)(21 - 10)(21 - 14)} \text{ cm}^2$$

$$= \sqrt{21 \times 3 \times 11 \times 7} \text{ m}^2$$

$$= 21\sqrt{11} \text{ cm}^2$$

Q.2: The sides of a triangle are in the ratio of 12: 17: 25 and its perimeter is 540cm. Find its area.

Solution:

The ratio of the sides of the triangle is given as 12: 17: 25

Now, let the common ratio between the sides of the triangle be “x”

\therefore The sides are 12x, 17x and 25x

It is also given that the perimeter of the triangle = 540 cm

$$12x + 17x + 25x = 540 \text{ cm}$$

$$\Rightarrow 54x = 540 \text{ cm}$$

$$\text{So, } x = 10$$

Now, the sides of the triangle are 120 cm, 170 cm, 250 cm.

So, the semi perimeter of the triangle (s) = $540/2 = 270 \text{ cm}$

Using Heron’s formula,

Area of the triangle

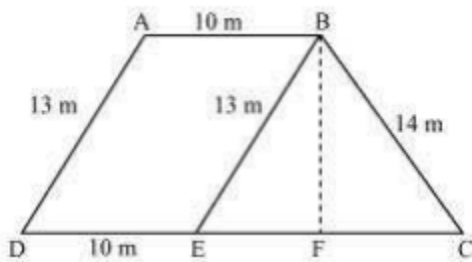
$$\begin{aligned}
 &= \sqrt{s(s-a)(s-b)(s-c)} \\
 &= \left[\sqrt{270(270-120)(270-170)(270-250)} \right] \text{cm}^2 \\
 &= \left[\sqrt{270 \times 150 \times 100 \times 20} \right] \text{cm}^2
 \end{aligned}$$

$$= 9000 \text{ cm}^2$$

Q.3: A field is in the shape of a trapezium whose parallel sides are 25 m and 10 m. The non-parallel sides are 14 m and 13 m. Find the area of the field.

Solution:

First, draw a line segment BE parallel to the line AD. Then, from B, draw a perpendicular on the line segment CD.



Now, it can be seen that the quadrilateral ABED is a parallelogram. So,

$$AB = ED = 10 \text{ m}$$

$$AD = BE = 13 \text{ m}$$

$$EC = 25 - ED = 25 - 10 = 15 \text{ m}$$

Now, consider the triangle BEC,

$$\text{Its semi perimeter (s)} = (13 + 14 + 15)/2 = 21 \text{ m}$$

By using Heron's formula,

$$\text{Area of } \triangle BEC =$$

$$\sqrt{s(s-a)(s-b)(s-c)}$$

$$\left(\sqrt{21 \times (21 - 13) \times (21 - 14) \times (21 - 15)} \right) m^2$$

$$\left(\sqrt{21 \times 8 \times 7 \times 6} \right) m^2$$

$$= 84 \text{ m}^2$$

We also know that the area of $\triangle BEC = \left(\frac{1}{2}\right) \times CE \times BF$

$$84 \text{ cm}^2 = \left(\frac{1}{2}\right) \times 15 \times BF$$

$$\Rightarrow BF = (168/15) \text{ cm} = 11.2 \text{ cm}$$

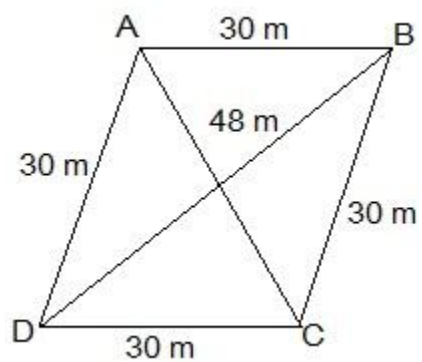
So, the total area of ABED will be $BF \times DE$, i.e. $11.2 \times 10 = 112 \text{ m}^2$

$$\therefore \text{Area of the field} = 84 + 112 = 196 \text{ m}^2$$

Q.4: A rhombus-shaped field has green grass for 18 cows to graze. If each side of the rhombus is 30 m and its longer diagonal is 48 m, how much area of grass field will each cow be getting?

Solution:

Draw a rhombus-shaped field first with the vertices as ABCD. The diagonal AC divides the rhombus into two congruent triangles which are having equal areas. The diagram is as follows.



Consider the triangle BCD,

$$\text{Its semi-perimeter} = (48 + 30 + 30)/2 \text{ m} = 54 \text{ m}$$

Using Heron's formula,

Area of the $\Delta BCD =$

$$\begin{aligned} & \sqrt{s(s-a)(s-b)(s-c)} \\ & \left(\sqrt{54(54-48)(54-30)(54-30)} \right) m^2 \\ & \left(\sqrt{54 \times 6 \times 24 \times 24} \right) m^2 \end{aligned}$$

$$= 432 \text{ m}^2$$

$$\therefore \text{Area of field} = 2 \times \text{area of the } \Delta BCD = (2 \times 432) \text{ m}^2 = 864 \text{ m}^2$$

Thus, the area of the grass field that each cow will be getting = $(864/18) \text{ m}^2 = 48 \text{ m}^2$

Q.5: Find the cost of laying grass in a triangular field of sides 50 m, 65 m and 65 m at the rate of Rs 7 per m^2 .

Solution:

According to the question,

Sides of the triangular field are 50 m, 65 m and 65 m.

Cost of laying grass in a triangular field = Rs 7 per m^2

Let $a = 50$, $b = 65$, $c = 65$

$$s = (a + b + c)/2$$

$$\Rightarrow s = (50 + 65 + 65)/2$$

$$= 180/2$$

$$= 90.$$

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

$$= \sqrt{(90(90-50)(90-65)(90-65))}$$

$$= \sqrt{(90 \times 40 \times 25 \times 25)}$$

$$= 1500 \text{ m}^2$$

$$\text{Cost of laying grass} = \text{Area of triangle} \times \text{Cost per } \text{m}^2$$

$$= 1500 \times 7$$

= Rs.10500

Q.6: The perimeter of an isosceles triangle is 32 cm. The ratio of the equal side to its base is 3: 2. Find the area of the triangle.

Solution:

According to the question,

The perimeter of the isosceles triangle = 32 cm

It is also given that,

Ratio of equal side to base = 3 : 2

Let the equal side = $3x$

So, base = $2x$

Perimeter of the triangle = 32

$$\Rightarrow 3x + 3x + 2x = 32$$

$$\Rightarrow 8x = 32$$

$$\Rightarrow x = 4.$$

$$\text{Equal side} = 3x = 3 \times 4 = 12$$

$$\text{Base} = 2x = 2 \times 4 = 8$$

The sides of the triangle = 12cm, 12cm and 8cm.

Let $a = 12$, $b = 12$, $c = 8$

$$s = (a + b + c)/2$$

$$\Rightarrow s = (12 + 12 + 8)/2$$

$$= 32/2$$

$$= 16.$$

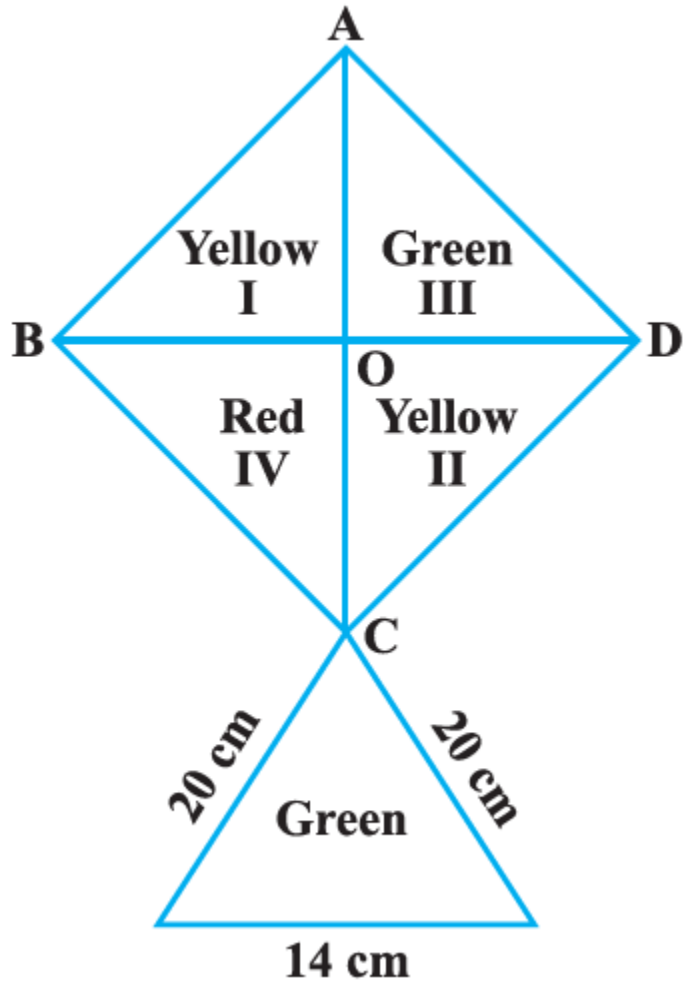
$$\text{Area of the triangle} = \sqrt{s(s-a)(s-b)(s-c)}$$

$$= \sqrt{(16(16-12)(16-12)(16-8))}$$

$$= \sqrt{(16 \times 4 \times 4 \times 8)}$$

$$= 32\sqrt{2} \text{ cm}^2$$

Q.7: How much paper of each shade is needed to make a kite given in the figure, in which ABCD is a square with diagonal 44 cm.



Solution:

According to the figure,

$$AC = BD = 44\text{cm}$$

$$AO = 44/2 = 22\text{cm}$$

$$BO = 44/2 = 22\text{cm}$$

From $\triangle AOB$,

$$AB^2 = AO^2 + BO^2$$

$$\Rightarrow AB^2 = 22^2 + 22^2$$

$$\Rightarrow AB^2 = 2 \times 22^2$$

$$\Rightarrow AB = 22\sqrt{2} \text{ cm}$$

$$\text{Area of square} = (\text{Side})^2$$

$$= (22\sqrt{2})^2$$

$$= 968 \text{ cm}^2$$

$$\text{Area of each triangle (I, II, III, IV)} = \text{Area of square} / 4$$

$$= 968 / 4$$

$$= 242 \text{ cm}^2$$

To find area of lower triangle,

$$\text{Let } a = 20, b = 20, c = 14$$

$$s = (a + b + c) / 2$$

$$\Rightarrow s = (20 + 20 + 14) / 2 = 54 / 2 = 27.$$

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

$$= \sqrt{[27(27-20)(27-20)(27-14)]}$$

$$= \sqrt{[27 \times 7 \times 7 \times 13]}$$

$$= 131.14 \text{ cm}^2$$

Therefore,

We get,

$$\text{Area of Red} = \text{Area of IV}$$

$$= 242 \text{ cm}^2$$

$$\text{Area of Yellow} = \text{Area of I} + \text{Area of II}$$

$$= 242 + 242$$

$$= 484 \text{ cm}^2$$

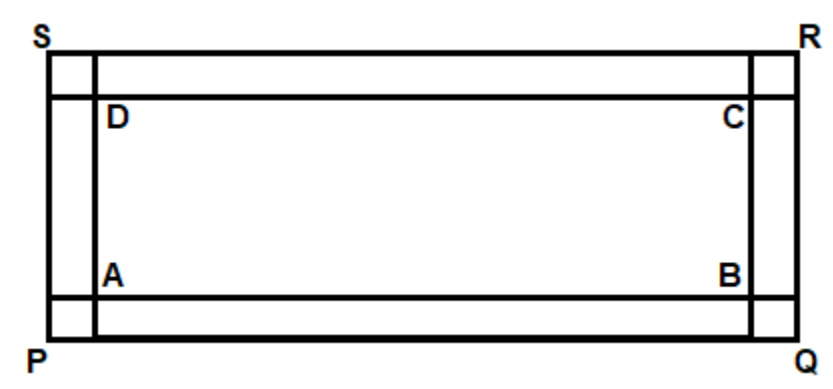
Area of Green = Area of III + Area of the lower triangle

$$= 242 + 131.14$$

$$= 373.14 \text{ cm}^2$$

Q.8: A rectangular plot is given for constructing a house, having a measurement of 40 m long and 15 m in the front. According to the laws, a minimum of 3 m, wide space should be left in the front and back each and 2 m wide space on each of other sides. Find the largest area where a house can be constructed.

Solution:



Let the given rectangle be rectangle PQRS,

According to the question,

$$PQ = 40\text{m and } QR = 15\text{m}$$

As 3m is left in both front and back,

$$AB = PQ - 3 - 3$$

$$\Rightarrow AB = 40 - 6$$

$$\Rightarrow AB = 34\text{m}$$

Also,

Given that 2m has to be left at both the sides,

$$BC = QR - 2 - 2$$

$$\Rightarrow BC = 15 - 4$$

$$\Rightarrow BC = 11\text{m}$$

Now, Area left for house construction is the area of ABCD.

Hence,

$$\text{Area(ABCD)} = AB \times CD$$

$$= 34 \times 11$$

$$= 374 \text{ m}^2$$

Benefits of Practicing Important Questions for Class 9 Maths Chapter 12

Practicing important questions for Class 9 Maths Chapter 12 on Heron's Formula provide several benefits for students:

Deepened Understanding: Regular practice helps solidify the concepts related to Heron's Formula, enhancing students comprehension of how to calculate the area of triangles with given side lengths.

Boosted Confidence: Familiarity with important questions reduces anxiety and builds confidence, making students feel more prepared as they approach their exams.

Enhanced Exam Readiness: Focusing on important questions ensures that students are well-equipped for their exams, as these problems similar the types they will face in exam.

Improved Time Management: Practicing with sample questions allows students to develop better time management skills helping them complete their exams within the allotted time effectively.