



Heron's Formula Ex 12.1 Q7

Answer :

Whenever we are given the measurement of all sides of a triangle, we basically look for Heron's formula to find out the area of the triangle. If we denote area of the triangle by A , then the area of a triangle having sides a , b , c and s as semi-perimeter is given by;

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

$$\text{Where, } s = \frac{a+b+c}{2}$$

We are given two sides of the triangle and perimeter = 240 dm .

That is $a = 78$ dm, $b = 50$ dm

We will find third side c and then the area of the triangle using Heron's formula.

$$2s = \text{perimeter}$$

$$2s = 240$$

$$s = 120$$

Now,

$$s = \frac{a+b+c}{2}$$

$$120 = \frac{78+50+c}{2}$$

$$120 \times 2 = 128 + c$$

$$c = 240 - 128$$

$$c = 112 \text{ dm}$$

Use Heron's formula to find out the area of the triangle. That is

$$A = \sqrt{120(120-78)(120-50)(120-112)}$$

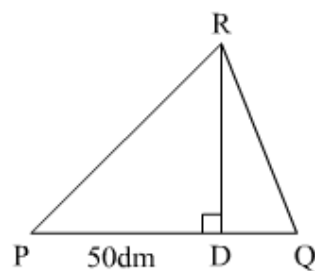
$$A = \sqrt{120(42)(70)(8)}$$

$$A = \sqrt{2822400}$$

$$A = 1680 \text{ dm}$$

Consider the triangle $\triangle PQR$ in which

$PQ=50$ dm, $PR=78$ dm, $QR=120$ dm



Where RD is the desired perpendicular length

Now from the figure we have

$$\begin{aligned}
 \text{Area of } \triangle PQR &= \frac{1}{2} \times \text{base} \times \text{height} \\
 &= \frac{1}{2} \times 50 \times RD \\
 1680 &= \frac{1}{2} \times 50 \times RD \\
 RD &= \frac{1680 \times 2}{50}
 \end{aligned}$$

$$\boxed{RD = 67.2 \text{ dm}}$$

Heron's Formula Ex 12.1 Q8

Answer :

Whenever we are given the measurement of all sides of a triangle, we basically look for Heron's formula to find out the area of the triangle.

If we denote area of the triangle by A , then the area of a triangle having sides a , b , c and s as semi-perimeter is given by;

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

$$\text{Where, } s = \frac{a+b+c}{2}$$

We are given: $a = 35 \text{ cm}$; $b = 54 \text{ cm}$; $c = 61 \text{ cm}$

$$s = \frac{35+54+61}{2}$$

$$s = \frac{150}{2}$$

$$s = 75 \text{ cm}$$

The area of the triangle is:

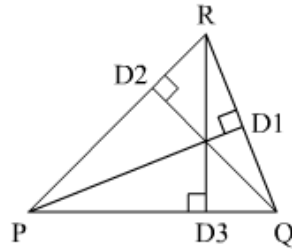
$$A = \sqrt{75(75-35)(75-54)(75-61)}$$

$$A = \sqrt{75(40)(21)(14)}$$

$$A = \sqrt{882000}$$

$$\boxed{A = 939.14 \text{ cm}^2}$$

Suppose the triangle is ΔPQR and focus on the triangle given below,



In which $PD1$, $QD2$ and $RD3$ are three altitudes

Where $PQ=35$ cm, $QR=54$ cm, $PR=61$ cm

We will calculate each altitude one by one to find the smallest one.

Case 1

In case of ΔPQR :

$$\text{Area of } \Delta PQR = \frac{1}{2} \times QR \times PD1$$

$$939.14 = \frac{1}{2} \times 54 \times PD1$$

$$PD1 = \frac{939.14 \times 2}{54}$$

$$= 34.78 \text{ cm}$$

Case 2

$$\text{Area of } \Delta PQR = \frac{1}{2} \times PR \times QD2$$

$$939.14 = \frac{1}{2} \times 61 \times QD2$$

$$QD2 = \frac{939.14 \times 2}{61}$$

$$= 30.79 \text{ cm}$$

Case 3

$$\text{Area of } \Delta PQR = \frac{1}{2} \times PQ \times RD3$$

$$939.14 = \frac{1}{2} \times 35 \times RD3$$

$$RD3 = \frac{939.14 \times 2}{35}$$

$$= 53.66 \text{ cm}$$

The smallest altitude is $QD2$.

The smallest altitude is the one which is drawn on the side of length 61 cm from apposite vertex.

smallest altitude = 30.79 cm

***** END *****