Assignment 4

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Question

$\triangle ABC$ is right angled at B. If a = 12 and b+c = 18, find b, c and draw the triangle.

Solution

Given a=12,

and b+c=18;

$\Rightarrow$ c=18-b (1)

Therefore,
we have 3 sides of given right triangle as BC=12,AC=b,AB=18-b.

By Pythagoras theorem,we have

Hypotenuse^2=Base^2+Altitude^2

As given triangle is right angled at B,side opposite to angle B is AC i,e b is

hypotenuse ,therfore,

$$b^2=12^2+(18-b)^2$$

$$b^2=144+324+b^2-36b$$

$$b=13 \quad (2)$$

$$\Rightarrow \qquad c = 18 - b$$
$$= 18 - 13 = 5 \qquad \text{(putting value of b from (2)in(1))}$$

So,the sides of triangle are: **a=12, b=13, c=5**.

Steps of Construction:-

1.Draw a line AC of length =13(i,e b) .

2.Taking A as centre draw an arc of radius =5(i,e c).

3.Taking C as centre draw an arc of radius=12(i,e a).

4.Name the point, where the two arcs meet(step 2 and step 3), as B.

5.Join BA and BC.

Required triangle is given below.

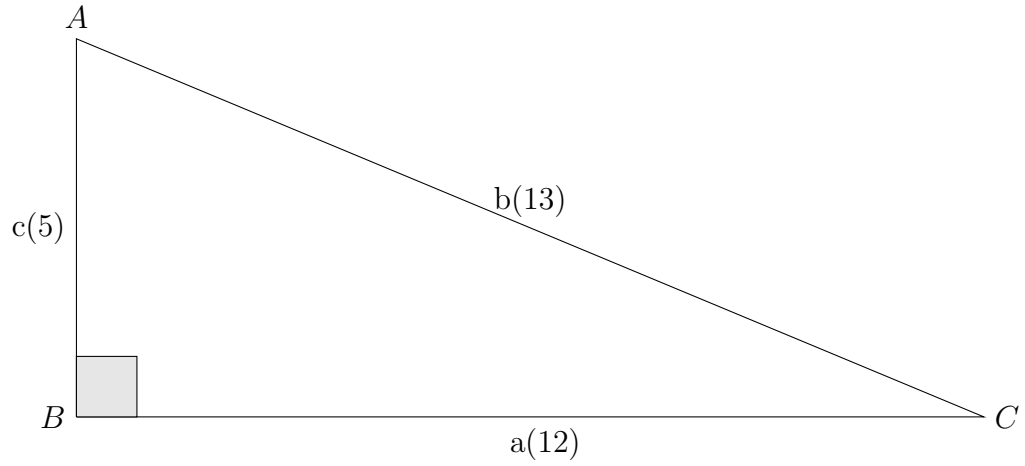

Figure of given triangle(using tikz command)