

# Assignment-4 Latex Report

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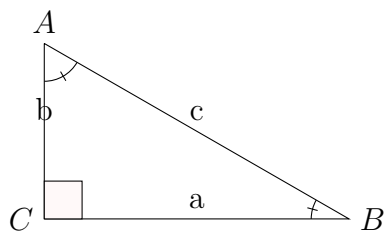
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## • Exercise 2.9

**1 Draw a  $\triangle ABC$ , given that  $a+b+c=11$ ,  $\angle B = 30^\circ$  and  $\angle C = 90^\circ$**

### 1.1 Solution

Figure of triangle ABC



It,s given that,

$$a + b + c = 11 \quad (1)$$

and,

$$\angle B = 30^\circ \text{ Now, } \sin(30^\circ) = \frac{b}{c}$$

$$\frac{1}{2} = \frac{b}{c}$$

therefore,

$$b = \frac{c}{2} \quad (2)$$

$$\text{Also, } \cos(30^\circ) = \frac{a}{c}$$

$$\frac{\sqrt{3}}{2} = \frac{a}{c}$$

therefore,

$$a = \frac{c\sqrt{3}}{2} \quad (3)$$

Now substituting the values of b and a in the equation (1).

we get,

$$\frac{c\sqrt{3}}{2} + \frac{c}{2} + c = 11$$

$$\frac{c\sqrt{3} + c + 2c}{2} = 11$$

$$c\sqrt{3} + 3c = 22$$

$$c(3 + \sqrt{3}) = 22$$

$$c = \frac{22}{3 + \sqrt{3}}$$

$$c = \frac{22}{3 + \sqrt{3}} * \frac{3 - \sqrt{3}}{3 - \sqrt{3}}$$

$$c = \frac{27.9}{6}$$

$$c = 4.65 \quad (4)$$

Now using value of c in equation(2) and equation(3)

we get,

$$a = \frac{4.65\sqrt{3}}{2}$$

$$a=4.03$$

and,  
 $b=2.32$

hence we got,

$$a=4.03$$

$$b=2.32$$

$$c=4.65$$

since sum of angles of a triangle is always equal to  $180^\circ$

therefore in the given Triangle,

$$\angle A + \angle B + \angle C = 180^\circ$$

$$[\angle B = 30^\circ \text{ and } \angle C = 90^\circ - \text{given}]$$

therefore,

$$\angle A + 30^\circ + 90^\circ = 180^\circ$$

$$\angle A = 180^\circ - 120^\circ$$

$$\angle A = 60^\circ$$

## 1.2 Figure of $\triangle ABC$ ,

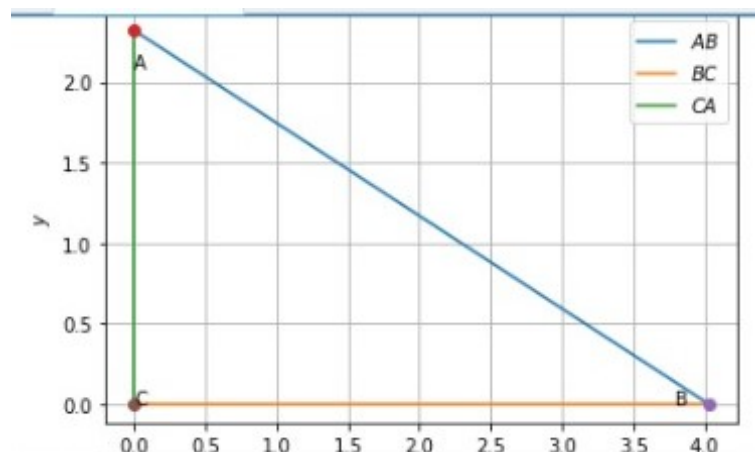


Figure 1: Fig generated using python

Download the python code used for generating the figure from  
 here:

<https://github.com/FuzayilMir/Assignment-4-Construct/blob/main/TRICODE.py>