Assignment-4
Latex Report

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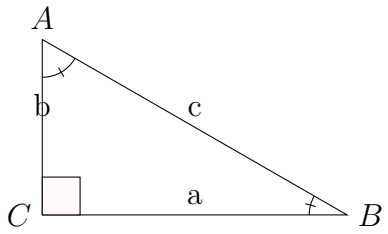
20/01/2021

- **Exercise 2.9**

1 Draw a △ABC, given that a+b+c= 11, ∠B = 30° and ∠C = 90°

1.1 Solution

Figure of triangle ABC



It,s given that,

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

and,

$\angle B = 30°$ Now, $\text{Sin}(30°) = \frac{b}{c}$

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

therefore,

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

Also, $\text{Cos}(30°) = \frac{a}{c}$

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

therefore,

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

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

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

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

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

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

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

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

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

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

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,

$\boxed{\text{a=4.03}}$

$\boxed{\text{b=2.32}}$

$\boxed{\text{c=4.65}}$

since sum of angles of a triangle is always equal to 180°

therefore in the given Triangle,

∠A+∠B+∠C=180°

[$\angle B = 30°$ and ∠C=90°–given]
therefore,

∠A+30°+90°=180°

∠A=180°-120°

$\boxed{\angle A=60°}$

Hence all the equations that have been formed in terms of the variables a,b and c based on the given information are as follows,

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

1.2 Figure of △ABC,

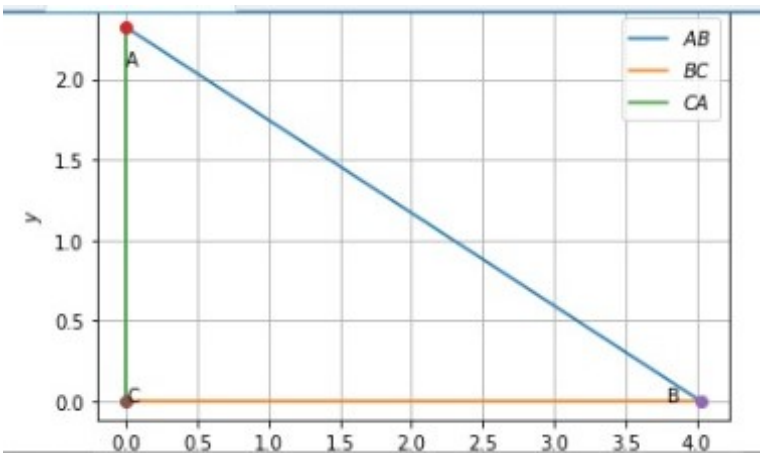


Figure 1: Fig generated using python

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

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