

Assignment 1

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Download all python codes from

<https://github.com/B.Ramana/Matrix-theory/codes>

and latex-tikz codes from

<https://github.com/B.Ramana/Matrix-theory>

Case:2

QUESTION No. 2.20

construct $\triangle ABC$ given that $\angle A = 60^\circ$, $\angle B = 30^\circ$ and $AB=5.8$

SOLUTION

Given,

$$\angle A = 60^\circ, \angle B = 30^\circ AB = 5.8 \quad (0.0.1)$$

let's first drawn a diagram. To construct $\triangle ABC$, we first need to find $\angle C$ Finding $\angle C$ in $\triangle ABC$

$$\angle A + \angle B + \angle C = 180^\circ \quad (0.0.2)$$

$$60^\circ + 30^\circ + \angle C = 180^\circ \quad (0.0.3)$$

$$90^\circ + \angle C = 180^\circ \quad (0.0.4)$$

$$\angle C = 180^\circ - 90^\circ \quad (0.0.5)$$

$$\angle C = 90^\circ \quad (0.0.6)$$

Now finding "Opposite" and "adjacent" where "hypotenuse" is given $AB=5.8$.

Case:1

$$\angle B = 30^\circ \quad (0.0.7)$$

$$\text{hypotenuse} = 5.8 \quad (0.0.8)$$

$$\text{Opposite side} = \frac{\text{hypotenuse}}{\sin 30^\circ} \quad (0.0.9)$$

$$\text{Opposite side} = \frac{5.8}{0.5} \quad (0.0.10)$$

$$\text{Opposite side} = 2.9; \quad (0.0.11)$$

$$\text{Adjacent side} = \frac{\text{hypotenuse}}{\cos 30^\circ} \quad (0.0.12)$$

$$\text{Adjacent side} = \frac{5.8}{0.866} \quad (0.0.13)$$

$$\text{Adjacent side} = 4.10; \quad (0.0.14)$$

$$\text{let } \angle A = 60^\circ \quad (0.0.15)$$

$$\text{hypotenuse} = 5.8 \quad (0.0.16)$$

$$\text{Opposite side} = \frac{\text{hypotenuse}}{\sin 60^\circ} \quad (0.0.17)$$

$$\text{Opposite side} = \frac{5.8}{0.866} \quad (0.0.18)$$

$$\text{Opposite side} = 4.10; \quad (0.0.19)$$

$$\text{Adjacent side} = \frac{\text{hypotenuse}}{\cos 60^\circ} \quad (0.0.20)$$

$$\text{Adjacent side} = \frac{5.8}{0.5} \quad (0.0.21)$$

$$\text{Adjacent side} = 2.9; \quad (0.0.22)$$

$$(0.0.23)$$

By solving ,we get Values :

$$\Rightarrow a = 4.10; \quad (0.0.24)$$

$$\Rightarrow b = 2.9; \quad (0.0.25)$$

$$\Rightarrow c = 5.8 \quad (0.0.26)$$

$$(0.0.27)$$

The Vertices of $\triangle ABC$ are

$$\mathbf{A} = \begin{pmatrix} 0 \\ c \end{pmatrix} = \begin{pmatrix} 0 \\ 5.8 \end{pmatrix} \quad (0.0.28)$$

$$\mathbf{B} = \begin{pmatrix} a \\ 0 \end{pmatrix} = \begin{pmatrix} 4.10 \\ 0 \end{pmatrix} \quad (0.0.29)$$

$$\mathbf{C} = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \quad (0.0.30)$$

Plot the $\triangle ABC$ is as follows:

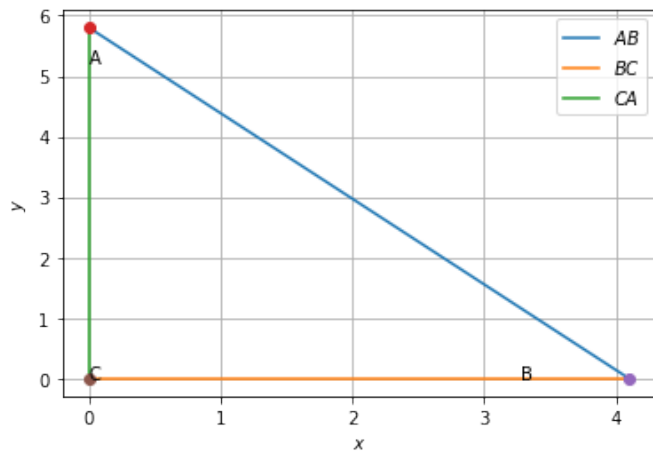


Fig. 0: $\triangle ABC$