3.3.20

EE24BTECH11007 - Arnav Makarand Yadnopavit

Question:
Draw a triangle ABC in which AB=5 cm, BC=6 cm and ∠ ABC = 60°.Then construct
a triangle whose sides are $\frac{5}{7}$ times the corresponding sides of △ABC.
Solution:

Symbol	Description	Value
a	length of side BC	6 cm
b	length of side CA	b
c	length of side AB	5 cm
a_0	length of side BC of second triangle	a_0
b_0	length of side CA of second triangle	b_0
c_0	length of side AB of second triangle	c_0
$\angle B$	angle at vertex B	60°

TABLE 0: Given Values

Using cosine rule

$$cos(\angle B) = \frac{a^2 + c^2 - b^2}{2ac} \tag{0.1}$$

$$\therefore b = \sqrt{31} \tag{0.2}$$

As sides of second triangle are $\frac{5}{7}$ times the corresponding sides of △ABC.

$$a_0 = \frac{30}{7} cm \tag{0.3}$$

$$b_0 = \frac{25}{7} cm \tag{0.4}$$
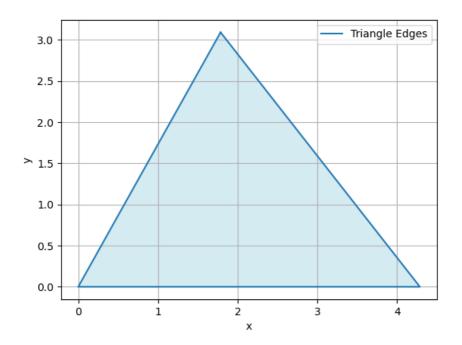
$$c_0 = \frac{5\sqrt{31}}{7} cm \tag{0.5}$$

$$\tag{0.6}$$

Fig. 0.1: Plot of △ABC