

3.2.17

EE24BTECH11008 - Aslin Garvasis

Question:

Construct a triangle whose sides are 3.6cm , 3.0cm and 4.8cm . Bisect the smallest angle and measure each part.

Solution:

\therefore The smallest angle is associated with the opposite smallest side.

| Variable | value | Description |
|----------|--|---|
| A | $\begin{pmatrix} 0 \\ 0 \end{pmatrix}$ | coordinates of first point |
| B | $\begin{pmatrix} 4.8 \\ 0 \end{pmatrix}$ | coordinates of second point |
| C | $\begin{pmatrix} 2.81 \\ 2.24 \end{pmatrix}$ | coordinates of third point |
| D | - | intersection of angle bisector of A in BC |

TABLE 0: Input parameters

The angle bisector of a triangle of a triangle divides the opposite side into two parts proportional to the other two sides of the triangle.

$$\therefore \|AC\| = 3.6 \quad (0.1)$$

$$\therefore \|AB\| = 4.8 \quad (0.2)$$

$$\therefore \|BC\| = 3 \quad (0.3)$$

$$\therefore \mathbf{D} = \frac{\|AC\| \cdot \mathbf{B} + \|AB\| \cdot \mathbf{C}}{\|AC\| + \|BC\|} \quad (0.4)$$

$$\Rightarrow \mathbf{D} = 3.6 \begin{pmatrix} 4.8 \\ 0 \end{pmatrix} + 4.8 \begin{pmatrix} 2.81 \\ 2.24 \end{pmatrix} = \begin{pmatrix} 3.66 \\ 1.28 \end{pmatrix} \quad (0.5)$$

$$\Rightarrow \|BD\| = \frac{\|BC\| \|AB\|}{\|AB\| + \|AC\|} = 1.71 \quad (0.6)$$

$$\Rightarrow \|CD\| = \frac{\|BC\| \|AC\|}{\|AB\| + \|AC\|} = 1.28 \quad (0.7)$$

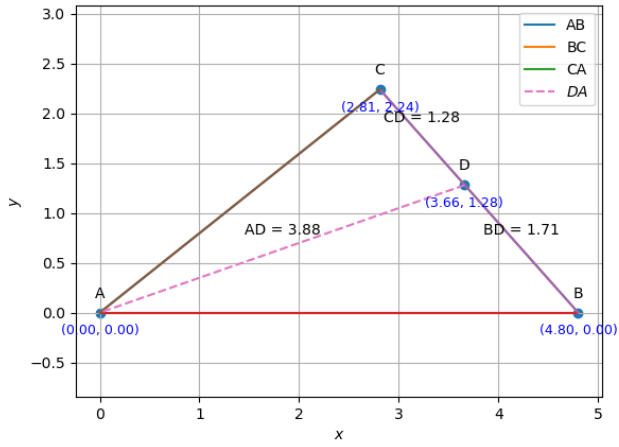


Fig. 0.1: Plot of points A, B, C and D