

1-1.8-3

EE24BTECH11005 - Arjun Pavanje

Question:

Find the lengths of the medians of the triangle with vertices **A** (0, 0, 6), **B** (0, 4, 0), **C** (6, 0, 0)

Solution:

Variable	Description
A	(0, 0, 6) point
B	(0, 4, 0) point
C	(6, 0, 0) point
D	Midpoint of BC
E	Midpoint of CA
F	Midpoint of AB

TABLE I: Variables Used

1)

$$D = \frac{B+C}{2} = \begin{pmatrix} 3 \\ 2 \\ 0 \end{pmatrix} \quad (1)$$

$$\left\| \frac{B+C}{2} - A \right\| = \sqrt{\left(\frac{B+C}{2} - A \right)^T \left(\frac{B+C}{2} - A \right)} = \sqrt{49} \quad (2)$$

Median $AD = 7$

2)

$$E = \frac{C+A}{2} = \begin{pmatrix} 3 \\ 0 \\ 3 \end{pmatrix} \quad (3)$$

$$\left\| \frac{C+A}{2} - B \right\| = \sqrt{\left(\frac{C+A}{2} - B \right)^T \left(\frac{C+A}{2} - B \right)} = \sqrt{34} \quad (4)$$

Median $BE = \sqrt{34}$

3)

$$F = \frac{A+B}{2} = \begin{pmatrix} 0 \\ 2 \\ 3 \end{pmatrix} \quad (5)$$

$$\left\| \frac{A+B}{2} - C \right\| = \sqrt{\left(\frac{A+B}{2} - C \right)^T \left(\frac{A+B}{2} - C \right)} = \sqrt{49} \quad (6)$$

Median $CF = 7$

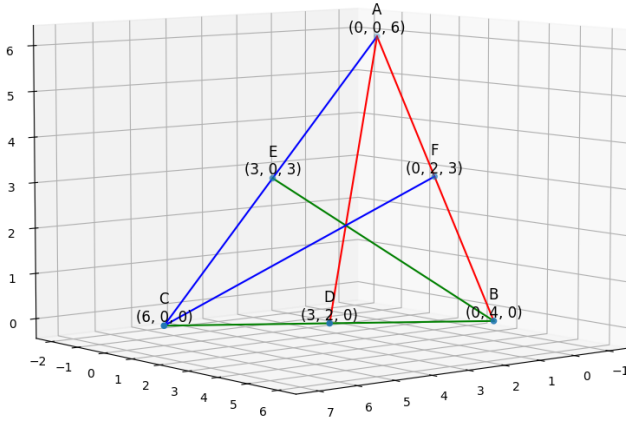


Fig. 1: Plot of the points