

Random Vector Assignment

EE22BTECH11043 - RAMBHA SATVIK

The randomly generated vectors are:

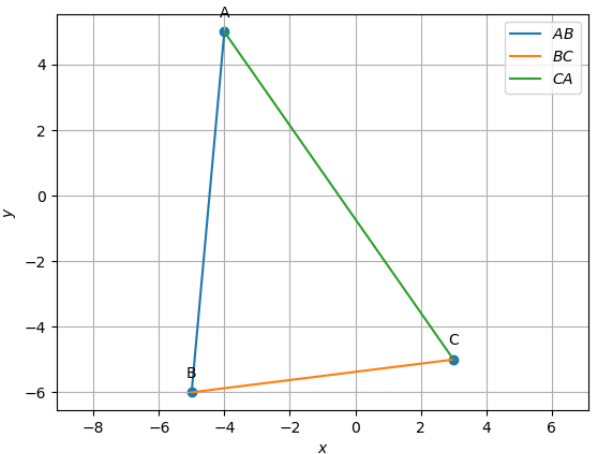


Fig. 0. Vectors

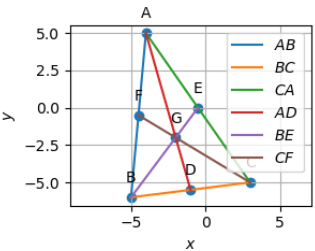


Fig. 0. Medians

I. VECTORS

| Parameter | Value | Description |
|-------------------|--|------------------------|
| \mathbf{m}_1 | $\begin{pmatrix} 1 \\ 11 \end{pmatrix}$ | Direction vector of AB |
| \mathbf{m}_2 | $\begin{pmatrix} 8 \\ 1 \end{pmatrix}$ | Direction vector of BC |
| \mathbf{m}_3 | $\begin{pmatrix} -7 \\ 10 \end{pmatrix}$ | Direction vector of CA |
| Length of Side | 11.045 | AB |
| Length of Side | 8.062 | BC |
| Length of Side | 12.206 | CA |
| \mathbf{n}^\top | $\begin{pmatrix} -11 \\ 1 \end{pmatrix}$ | AB |
| c | 49 | |
| \mathbf{n}^\top | $\begin{pmatrix} 1 \\ -8 \end{pmatrix}$ | BC |
| c | 43 | |
| \mathbf{n}^\top | $\begin{pmatrix} 10 \\ 7 \end{pmatrix}$ | CA |
| c | -5 | |
| Area | 43.5 | ABC |
| Angle | 40.186 | A |
| Angle | 77.680 | B |
| Angle | 62.134 | C |

TABLE 0
VECTORS

II. MEDIAN

| Parameter | Value | Description |
|-------------------|--|---------------------------|
| Coordinates | $\begin{pmatrix} -1 \\ -5.5 \end{pmatrix}$ | D (midpoint of BC) |
| Coordinates | $\begin{pmatrix} -0.5 \\ 0 \end{pmatrix}$ | E (midpoint of CA) |
| Coordinates | $\begin{pmatrix} -4.5 \\ -0.5 \end{pmatrix}$ | F (midpoint of AB) |
| \mathbf{n}^\top | $\begin{pmatrix} -10.5 \\ -3 \end{pmatrix}$ | AD |
| c | 27 | |
| \mathbf{n}^\top | $\begin{pmatrix} 6 \\ -4.5 \end{pmatrix}$ | BE |
| c | -3 | |
| \mathbf{n}^\top | $\begin{pmatrix} 4.5 \\ 7.5 \end{pmatrix}$ | CF |
| c | -24 | |
| Centroid (G) | $\begin{pmatrix} -2 \\ -2 \end{pmatrix}$ | Intersection of BE and CF |

TABLE 0
MEDIAN

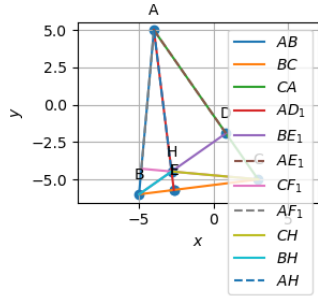


Fig. 0. Altitude

III. ALTITUDE

| Parameter | Value | Description |
|-------------------|--|-----------------------------------|
| \mathbf{n}^\top | $\begin{pmatrix} 8 \\ 1 \end{pmatrix}$ | AD_1 |
| c | -27 | |
| \mathbf{n}^\top | $\begin{pmatrix} -7 \\ 10 \end{pmatrix}$ | BE_1 |
| c | -3 | |
| \mathbf{n}^\top | $\begin{pmatrix} -1 \\ -11 \end{pmatrix}$ | CF_1 |
| c | 52 | |
| Orthocentre (H) | $\begin{pmatrix} -2.82 \\ -4.47 \end{pmatrix}$ | Intersection of BE_1 and CF_1 |

TABLE 0
ALTITUDE

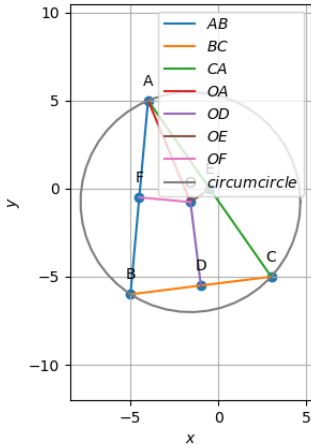


Fig. 0. PERPENDICULAR BISECTORS

IV. PERPENDICULAR BISECTORS

| Parameter | Value | Description |
|-------------------|--|------------------------------------|
| \mathbf{n}^\top | $\begin{pmatrix} 1 \\ 11 \end{pmatrix}$ | OF (Perpendicular Bisector of AB) |
| c | -10 | |
| \mathbf{n}^\top | $\begin{pmatrix} -8 \\ -1 \end{pmatrix}$ | OD (Perpendicular Bisector of BC) |
| c | 13.5 | |
| \mathbf{n}^\top | $\begin{pmatrix} 7 \\ -10 \end{pmatrix}$ | OE (Perpendicular Bisector of CA) |
| c | -3.5 | |
| Circumcentre (O) | $\begin{pmatrix} -1.59 \\ -0.76 \end{pmatrix}$ | Point of intersection of OE and OF |
| Radius | 6.247 | Radius of circumcircle |

TABLE 0
PERPENDICULAR BISECTORS

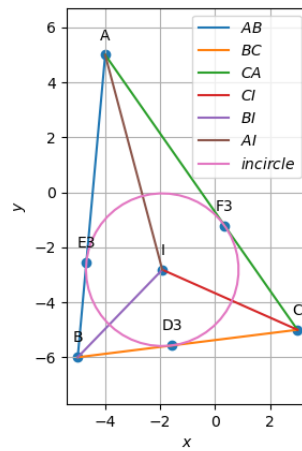


Fig. 0. ANGLE BISECTORS

V. ANGLE BISECTORS

| Parameter | Value | Description |
|----------------|--|------------------------------------|
| \mathbf{n}^T | $\begin{pmatrix} -1.82 \\ -0.48 \end{pmatrix}$ | AI (Angle Bisector of A) |
| c | 4.846 | |
| \mathbf{n}^T | $\begin{pmatrix} 1.12 \\ -1.08 \end{pmatrix}$ | BI (Angle Bisector of B) |
| c | 0.897 | |
| \mathbf{n}^T | $\begin{pmatrix} 0.69 \\ 1.57 \end{pmatrix}$ | CI (Angle Bisector of C) |
| c | 5.047 | |
| Incentre (I) | (0.24 -3.98) | Point of intersection of BI and CI |
| Distance | 2.778 | I from BC |
| Distance | 2.778 | I from AB |
| Distance | 2.778 | I from AC |
| Inradius | 2.778 | Radius of Incircle |

TABLE 0
ANGLE BISECTORS