Random vectors

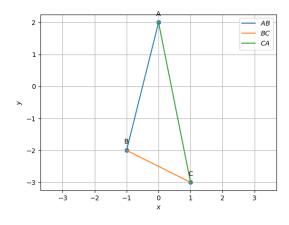
Chhatrapati-EE22BTECH11012

Random vectors are:

$$\mathbf{A} = \begin{pmatrix} 0 \\ 2 \end{pmatrix}; \mathbf{B} = \begin{pmatrix} -1 \\ -2 \end{pmatrix}; \mathbf{C} = \begin{pmatrix} 1 \\ -3 \end{pmatrix}$$

I. Vectors

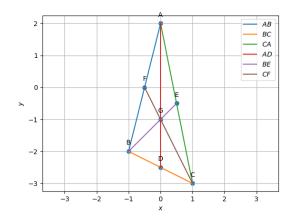
Parameters	Values	Description
$\mathbf{m_1}$	$\begin{pmatrix} -1 \\ -4 \end{pmatrix}$	$\mathbf{B} - \mathbf{A}$
\mathbf{m}_2	$\begin{pmatrix} 2 \\ -1 \end{pmatrix}$	C – B
m ₃	$\begin{pmatrix} -1 \\ 5 \end{pmatrix}$	A - C
$ \mathbf{B} - \mathbf{A} $	4.1231	length of AB
$\ \mathbf{C} - \mathbf{B}\ $	2.236	length of BC
$ \mathbf{A} - \mathbf{C} $	5.099	length of CA
$ \operatorname{rank}\begin{pmatrix} 1 & 1 & 1 \\ \mathbf{A} & \mathbf{B} & \mathbf{C} \end{pmatrix} $	3	Non-collinear
n ₁	$\begin{pmatrix} -4 \\ 1 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix} \mathbf{m_1}$
\mathbf{n}_2	$\begin{pmatrix} -1 \\ -2 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix} \mathbf{m_2}$
n ₃	$\binom{5}{1}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix} \mathbf{m_3}$
$\frac{1}{2} m_1 \times m_2 $	4.5	Area
∠A	25.3461°	
∠B	102.5288°	
$\angle C$	52.125°	



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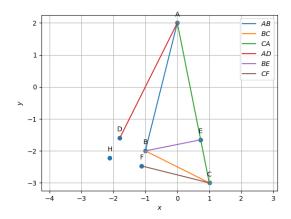
II. MEDIAN

11		D	
Parameters	Values	Description	
D	$\begin{pmatrix} 0 \\ 2.5 \end{pmatrix}$	$\frac{\mathbf{A} + \mathbf{B}}{2}$	
	(-2.5)	2	
E	$\left(\begin{array}{c}0.5\end{array}\right)$	$\frac{\mathbf{C} + \mathbf{A}}{2}$	
	(-0.5)	2	
F	(-0.5)	$\frac{\mathbf{B}+\mathbf{C}}{2}$	
-	(0)	2	
m ₄	(0)	$\mathbf{D} - \mathbf{A}$	
1114	(-4.5)	$\mathbf{D} - \mathbf{A}$	
	(1.5)	E D	
m ₅	(1.5)	$\mathbf{E} - \mathbf{B}$	
	(-1.5)	E C	
m ₆	$\left \left(\begin{array}{c} 3 \end{array} \right) \right $	$\mathbf{F} - \mathbf{C}$	
	(-4.5)	(0 1)	
n ₄	$\left(\begin{array}{c} 0 \end{array} \right)$	$\begin{pmatrix} 1 & 0 \end{pmatrix} \mathbf{m_4}$	
	(1.5)	(0 1)	
n ₅	$\begin{pmatrix} -1.5 \\ -1.5 \end{pmatrix}$	$\begin{pmatrix} 1 \\ -1 \end{pmatrix} \mathbf{m}_5$	
	(3)	(0 1)	
\mathbf{n}_{6}	$\begin{pmatrix} 1.5 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 \\ -1 & 0 \end{pmatrix}$ $\mathbf{m_6}$	
	(1.5)	,	
G	$\begin{pmatrix} 0 \\ -1 \end{pmatrix}$	<u>A+B+C</u> 3	
$ \mathbf{A} - \mathbf{G} $	3		
$\ \mathbf{D} - \mathbf{G}\ $	1.5		
$\frac{\ \mathbf{D} - \mathbf{G}\ }{\ \mathbf{B} - \mathbf{G}\ }$	1.4142		
$\frac{\ \mathbf{B} - \mathbf{G}\ }{\ \mathbf{E} - \mathbf{G}\ }$	0.7071	$\frac{AG}{DG} = \frac{BG}{FG} = \frac{CG}{FG} = \frac{2}{1}$	
$\frac{\ \mathbf{E} - \mathbf{G}\ }{\ \mathbf{C} - \mathbf{G}\ }$		DO EG FG 1	
	2.236		
$ \mathbf{F} - \mathbf{G} $	1.118		
$\operatorname{rank}\begin{pmatrix} 1 & 1 & 1 \\ A & D & G \end{pmatrix}$			
(1 1 1)	2	Points are collinear	
$\operatorname{rank}\begin{pmatrix} 1 & 1 & 1 \\ \mathbf{p} & \mathbf{r} & \mathbf{q} \end{pmatrix}$			
(B E G)			
$\operatorname{rank}\begin{pmatrix} 1 & 1 & 1 \\ G & F & G \end{pmatrix}$			
(C F G)			
AF	(0.5)	AFDE is a parallelogram	
ED	(2)	711 DL is a paranelogiam	



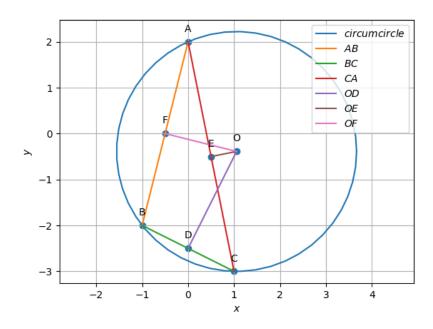
III. ALTITUDE

Parameters	Values	Description
$\mathbf{p_1}$	$\begin{pmatrix} 2 \\ -1 \end{pmatrix}$	alt AD_1
\mathbf{p}_2	$\begin{pmatrix} -1 \\ 5 \end{pmatrix}$	alt BE_1
p ₃	$\begin{pmatrix} -1 \\ -4 \end{pmatrix}$	alt CF_1
Н	$\begin{pmatrix} -2.111 \\ -2.222 \end{pmatrix}$	orthocentre



IV. PERPENDICULAR BISECTOR

Parameters	Values	Description
О	$\begin{pmatrix} 1.055 \\ -0.388 \end{pmatrix}$	circumcentre
$ \mathbf{O} - \mathbf{A} $		
$ \mathbf{O} - \mathbf{B} $	2.6117	circumradius
$ \mathbf{O} - \mathbf{C} $		



V. ANGLE BISECTOR

	GLL DISLCTO		
Parameters	Values	Description	
I - A	$\begin{pmatrix} 0.046 \\ 1.950 \end{pmatrix}$	angle bisector of A	
I – B	$\begin{pmatrix} 1.137 \\ 0.523 \end{pmatrix}$	angle bisector of B	
I – C	$\begin{pmatrix} 1.09 \\ -1.427 \end{pmatrix}$	angle bisector of C	
I	$\begin{pmatrix} -0.0851 \\ -1.579 \end{pmatrix}$	incentre	
R_i	0.7854	incentre radius	
$\angle BAI$	12 (72)	bisector of A	
∠CAI	12.673°		
$\angle ABI$	120 7250	1 D	
∠CBI	128.735°	bisector of B	
∠BCI	152.0270		
∠ACI	153.937°	bisector of C	
\mathbf{D}_3	(-0.4364)		
D ₃	(-2.2817)	mainta af intanaa-ti	
E	(0.685)	points of intersection	
$\mathbf{E_3}$	(-1.4251)		
T.	(-0.8471)		
$\mathbf{F_3}$	(-2.2817)		

