TABLE I
TABLE 1

Parameter	Values	Description
$\mathbf{m_1}$	$\begin{pmatrix}7\\-1\end{pmatrix}$	AB
$\mathbf{m_2}$	$\begin{pmatrix}-6\\2\end{pmatrix}$	BC
$\mathbf{m_3}$	$\begin{pmatrix}-1\\-1\end{pmatrix}$	CA
$\|\mathbf{B}-\mathbf{A}\|$	7.071	length of AB
$\|\mathbf{C}-\mathbf{B}\|$	6.324	length of BC
$\|\mathbf{A}-\mathbf{C}\|$	1.414	length of CA
rank	3	non collinear
$\mathbf{n_1}$	$\begin{pmatrix}-2\\-6\end{pmatrix}$	AB
c_1	-26	
$\mathbf{n_2}$	$\begin{pmatrix}1\\-1\end{pmatrix}$	BC
c_2	-7	
$\mathbf{n_3}$	$\begin{pmatrix}1\\7\end{pmatrix}$	CA
c_3	25	
Area	4	Area of triangle
$\angle A$	53.13°	Angle
$\angle B$	10.30°	
$\angle C$	116.56°	

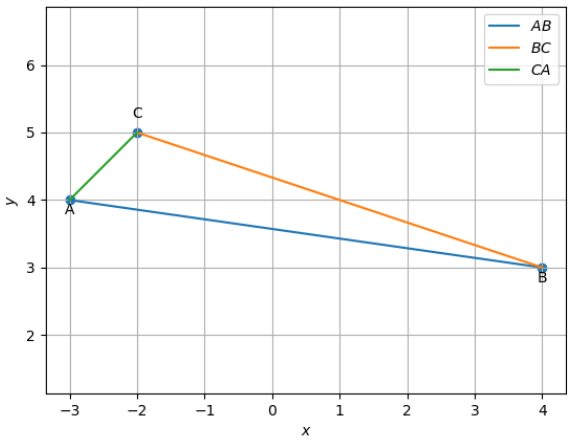

Fig. 1. Figure 1

TABLE II
TABLE 2

Parameter	Values	Description
$\mathbf{D}$	$\begin{pmatrix}1\\4\end{pmatrix}$	
$\mathbf{E}$	$\begin{pmatrix}\frac{-5}{2}\\\frac{9}{2}\end{pmatrix}$	Mid-points
$\mathbf{F}$	$\begin{pmatrix}\frac{1}{2}\\\frac{7}{2}\end{pmatrix}$	
$\mathbf{n_1}$	$\begin{pmatrix}0\\-4\end{pmatrix}$	AD
c_1	-16	
$\mathbf{n_2}$	$\begin{pmatrix}\frac{3}{2}\\\frac{13}{2}\end{pmatrix}$	BE
c_2	$\frac{51}{2}$	
$\mathbf{n_3}$	$\begin{pmatrix}\frac{-3}{2}\\\frac{-5}{2}\end{pmatrix}$	CF
c_3	$\frac{-19}{2}$	
$\mathbf{G}$	$\begin{pmatrix}\frac{-1}{3}\\4\end{pmatrix}$	Centroid
$\frac{GA}{DG}$	2	Equal
$\frac{GB}{EG}$	2	
$\frac{GC}{FG}$	2	
rank	2	collinear
$\|\mathbf{A}-\mathbf{F}\|$	$\begin{pmatrix}\frac{-7}{2}\\\frac{1}{2}\end{pmatrix}$	Equal
$\|\mathbf{E}-\mathbf{D}\|$	$\begin{pmatrix}\frac{-7}{2}\\\frac{1}{2}\end{pmatrix}$	Hence a parallelogram

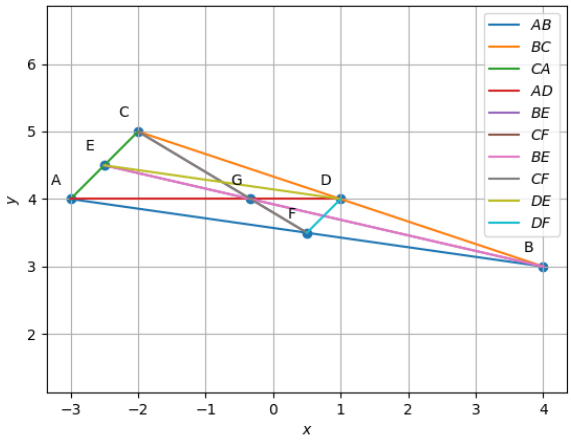

Fig. 2. Fig 2

TABLE III
TABLE 3

Parameter	Values	Description
$\mathbf{n_1}$	$\begin{pmatrix}6\\-2\end{pmatrix}$	Equation of
c_1	-26	altitude AP
$\mathbf{n_2}$	$\begin{pmatrix}1\\1\end{pmatrix}$	Equation of
c_2	7	altitude BQ
$\mathbf{n_3}$	$\begin{pmatrix}-7\\1\end{pmatrix}$	Equation of
c_3	19	altitude CR
$\mathbf{H}$	$\begin{pmatrix}\frac{-3}{2}\\\frac{17}{2}\end{pmatrix}$	orthocenter
	$(A-H)^T.(B-C)=0$	Verified

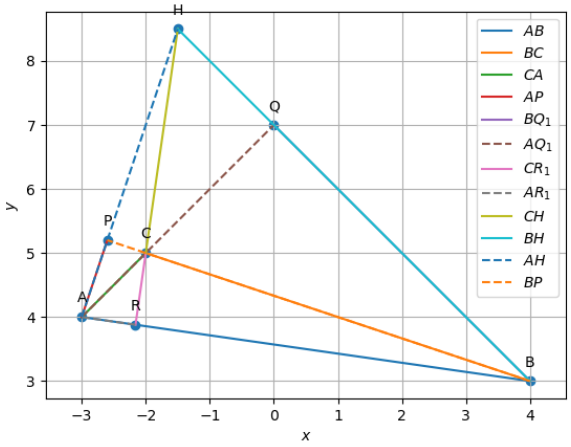

Fig. 3. Figure 3

TABLE IV
TABLE 4

Parameter	Values	Description
$\mathbf{n_1}$	$\begin{pmatrix}-6\\2\end{pmatrix}$	Perpendicular bisector
c_1	2	of BC
$\mathbf{n_2}$	$\begin{pmatrix}-1\\-1\end{pmatrix}$	Perpendicular bisector
c_2	-2	of CA
$\mathbf{n_3}$	$\begin{pmatrix}7\\-1\end{pmatrix}$	Perpendicular bisector
c_3	0	of AB
$\mathbf{O}$	$\begin{pmatrix}\frac{1}{4}\\\frac{7}{4}\end{pmatrix}$	Circumcentre
	$(O-(B+C)/2).(B-C)=0$	Verified
OA	3.952	$OA=OB=OC$
OB	3.952	Hence verified
OC	3.952	
$\angle BOC$	106.26°	$\angle BOC$=2 $\angle BAC$
$\angle BAC$	53.13°	Verified

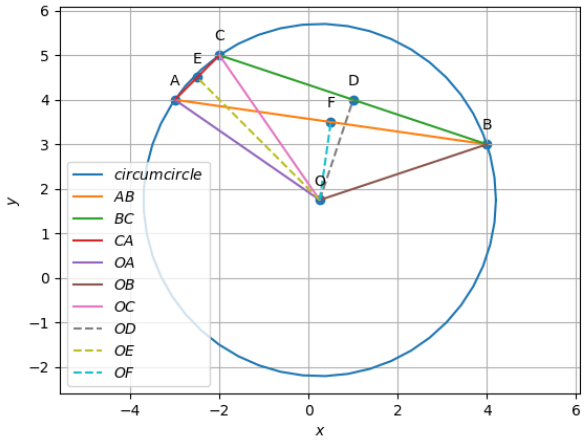

Fig. 4. Figure 4

TABLE V
TABLE 5

Parameter	Values	Description
$\mathbf{n_1}$	$\begin{pmatrix}0.57\\-1.7\end{pmatrix}$	Angular bisector
c_1	-8.48	of $\angle A$
$\mathbf{n_2}$	$\begin{pmatrix}0.46\\1.94\end{pmatrix}$	Angular bisector
c_2	7.64	of $\angle B$
$\mathbf{n_3}$	$\begin{pmatrix}-1.02\\-0.24\end{pmatrix}$	Angular bisector
c_3	0.84	of $\angle C$
$\mathbf{I}$	$\begin{pmatrix}-1.85\\4.38\end{pmatrix}$	Incenter
$\angle BAI$	26.56°	$\angle BAI$=$\angle CAI$
$\angle CAI$	26.56°	Verified
d_1	0.54	Distance between I and BC
d_2	0.54	Distance between I and CA
d_3	0.54	Distance between I and AB
D_3	$\begin{pmatrix}-1.68\\4.89\end{pmatrix}$	point of tangency by side BC
E_3	$\begin{pmatrix}-2.24\\4.76\end{pmatrix}$	point of tangency by side CA
F_3	$\begin{pmatrix}-1.93\\3.85\end{pmatrix}$	point of tangency by side AB
AE_3	1.08	$AE_3=AF_3=m$
AF_3	1.08	
BD_3	5.99	$BD_3=BF_3=n$
BF_3	5.99	
CD_3	0.33	$CD_3=CE_3=p$
CE_3	0.33	
m	1.08	$m=(b+c-a)/2$
n	5.99	$n=(c+a-b)/2$
p	0.33	$p=(a+b-c)/2$

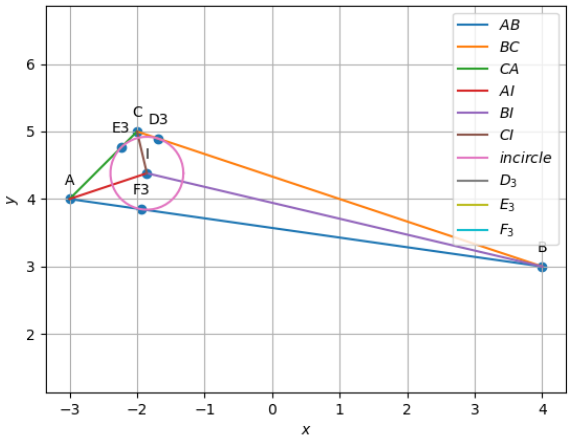

Fig. 5. Figure 5