

Solution with figure

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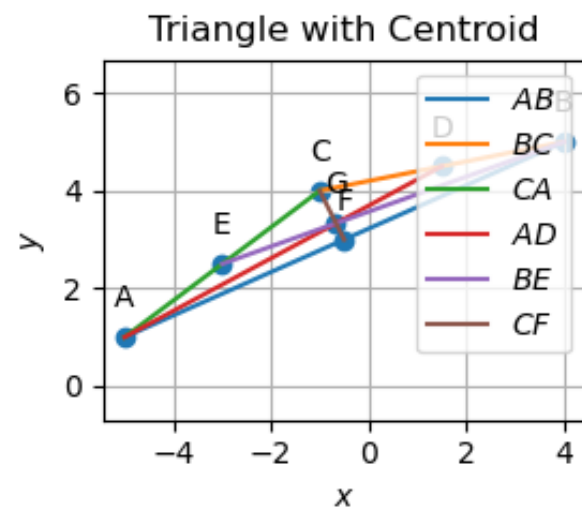


Fig. 0. Triangle

parameter	value	description
\mathbf{m}_1	$\begin{pmatrix} 9 \\ 4 \end{pmatrix}$	AB
\mathbf{m}_2	$\begin{pmatrix} -5 \\ -1 \end{pmatrix}$	BC
\mathbf{m}_3	$\begin{pmatrix} -4 \\ -3 \end{pmatrix}$	AC
$\ B - A\ $	5.83	AB
$\ C - B\ $	6.40	BC
$\ A - C\ $	9.21	AC
rank	3	points are not collinear
\mathbf{n}_1^T	$(4 \ -9)$	AB
c_1	-3	
\mathbf{n}_2^T	$(-1 \ 5)$	BC
c_2	5	
\mathbf{n}_3^T	$(-3 \ 4)$	AC
c_3	-39	
area	18.5	area of triangle
$\angle A$	12.90740°	Angle
$\angle B$	12.65255°	
$\angle C$	154.44003°	

TABLE 0
TRIANGLE

parameter	value	description
D	$\begin{pmatrix} 1.5 \\ -4.5 \end{pmatrix}$	midpoint of line BC
E	$\begin{pmatrix} -3 \\ -2.5 \end{pmatrix}$	midpoint of line AC
F	$\begin{pmatrix} -0.5 \\ 3 \end{pmatrix}$	midpoint of line AB
\mathbf{n}_4^T	$(3.5 \ -6.5)$	AD
c_4	18	
\mathbf{n}_5^T	$(-2.5 \ 7)$	BE
c_5	4	
\mathbf{n}_6^T	$(-1 \ -0.5)$	CF
c_6	-22	
G	$\begin{pmatrix} -0.6666666666666667 \\ 3.333333333333333 \end{pmatrix}$	centroid of triangle

TABLE 0
TRIANGLE WITH MIDPOINT

parameter	value	description
\mathbf{n}_7^T	$(-5 \ -1)$	AD_1
c_7	-9	
\mathbf{n}_8^T	$(-4 \ -3)$	BE_1
c_8	9	
\mathbf{n}_9^T	$(9 \ 4)$	CF_1
c_9	0	
H	$\begin{pmatrix} -9.36 \\ 22.81 \end{pmatrix}$	orthocentre of triangle

TABLE 0
TRIANGLE WITH ORTHOCENTER

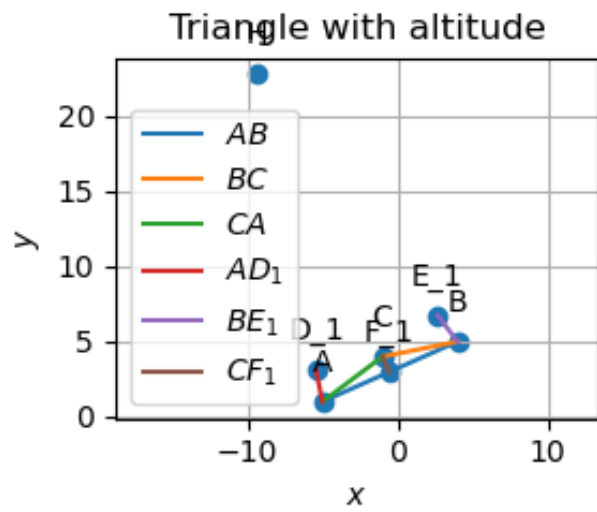


Fig. 0. Triangle

parameter	value	description
\mathbf{n}_{10}^\top	$\begin{pmatrix} 9 & 4 \end{pmatrix}$	Perpendicular bisector of AB
c_{10}	22	
\mathbf{n}_{11}^\top	$\begin{pmatrix} -5 & -1 \end{pmatrix}$	Perpendicular bisector of BC
c_{11}	-16.5	
\mathbf{n}_{12}^\top	$\begin{pmatrix} -4 & -3 \end{pmatrix}$	Perpendicular bisector of CA
c_{12}	-5.5	
\mathbf{O}	$\begin{pmatrix} 3.681 \\ -6.409 \end{pmatrix}$	Circumcircle
radius	4.65	

TABLE 0
TRIANGLE WITH CIRCUMCIRCLE

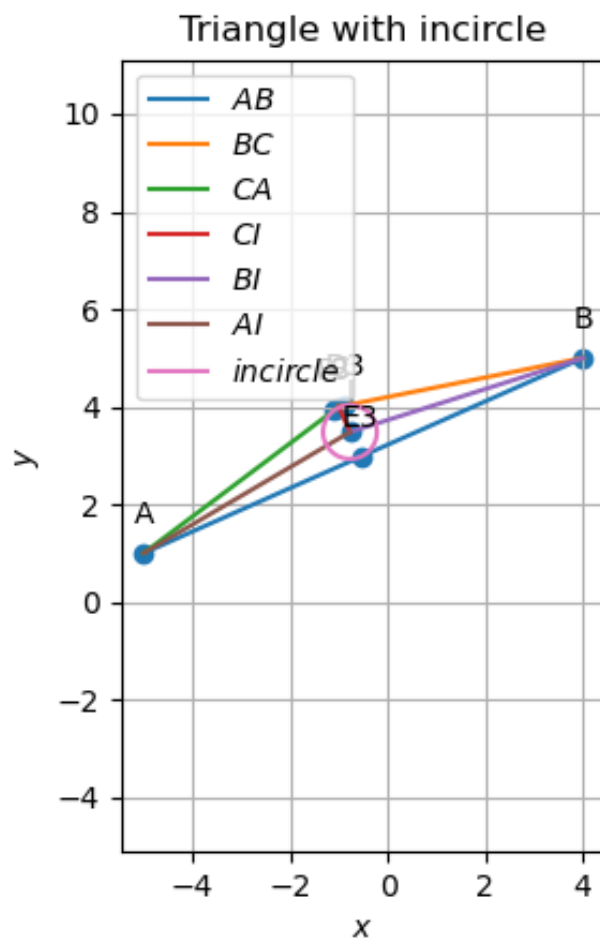


Fig. 0. Triangle

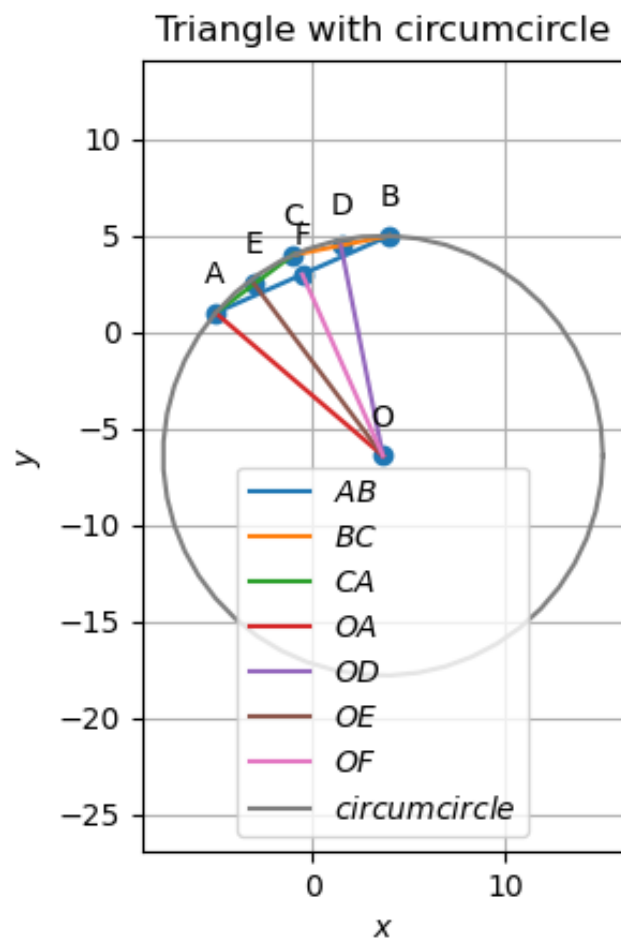


Fig. 0. Triangle