Answer Key Table

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Consider the vertices,

$$\mathbf{A} = \begin{pmatrix} 3 \\ -5 \end{pmatrix} \tag{1}$$

$$\mathbf{B} = \begin{pmatrix} 3 \\ 1 \end{pmatrix} \tag{2}$$

$$\mathbf{C} = \begin{pmatrix} -4 \\ -1 \end{pmatrix} \tag{3}$$

I. VECTORS

parameter	**value**	**description**
$\mathbf{m_1}$	$\begin{pmatrix} 0 \\ 6 \end{pmatrix}$	AB
$\mathbf{m_2}$	$\begin{pmatrix} -7 \\ -2 \end{pmatrix}$	BC
$\mathbf{m_3}$	$\begin{pmatrix} 7 \\ -4 \end{pmatrix}$	CA
$\|\|B-A\|\|$	7.28	AB
$\|\|C-B\|\|$	6.00	BC
$\|\|A-C\|\|$	8.06	AC
rank	3	points are not collinear
$\mathbf{n_1}^\top$	$\begin{pmatrix} 6 & 0 \end{pmatrix}$	AB
c_1	18	
$\mathbf{n_2}^\top$	$\begin{pmatrix} -2 & 7 \end{pmatrix}$	BC
c_2	1	
$\mathbf{n_3}^\top$	$\begin{pmatrix} -4 & -7 \end{pmatrix}$	AC
c_3	23	
area	21.00	area of triangle
$\angle A$	60.26°	Angle
$\angle B$	74.05°	
$\angle C$	45.69°	

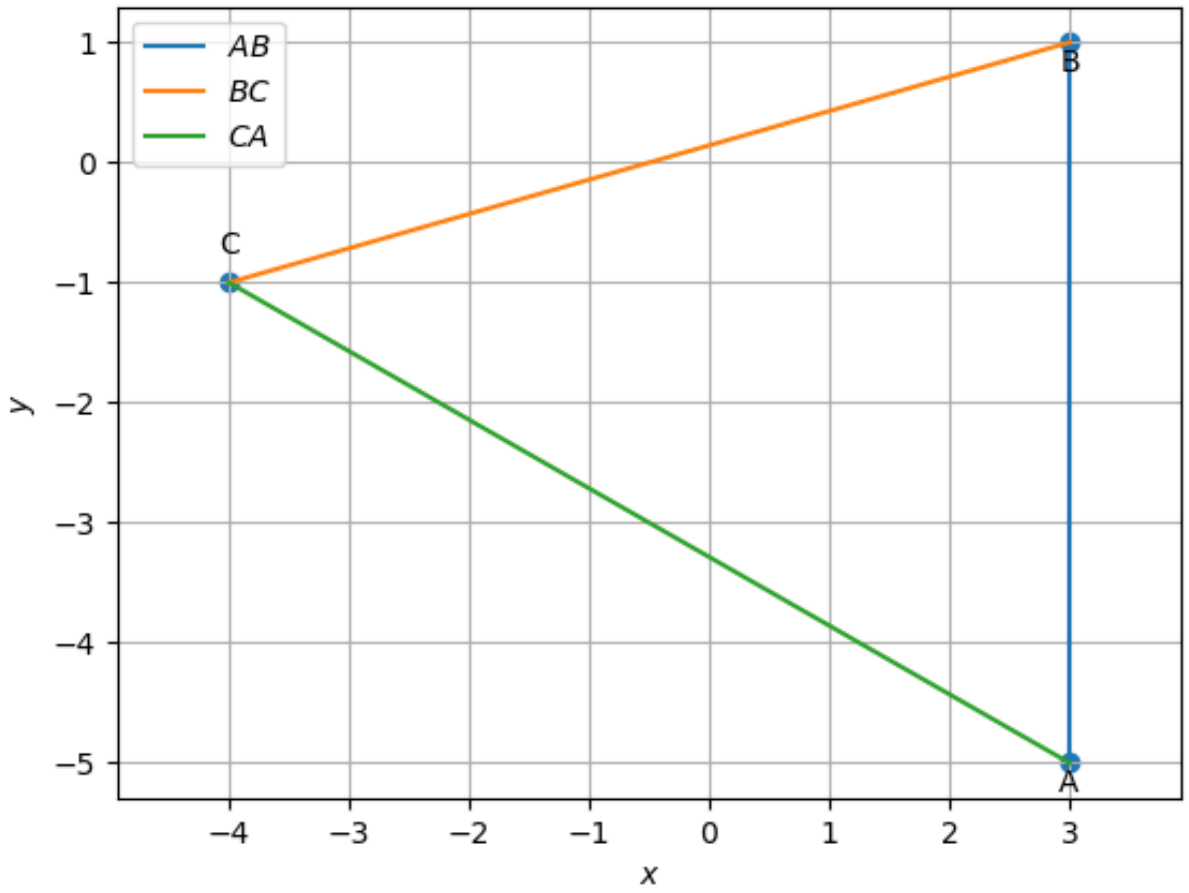

Fig. 0. Triangle ABC

II. MEDIANS

parameter	**value**	**description**
D	$\begin{pmatrix} -0.5 \\ 0 \end{pmatrix}$	midpoint of line BC
E	$\begin{pmatrix} -0.5 \\ -3 \end{pmatrix}$	midpoint of line AC
F	$\begin{pmatrix} 3 \\ -2 \end{pmatrix}$	midpoint of line AB
$\mathbf{n_4^\top}$	$\begin{pmatrix} 5 & 3.5 \end{pmatrix}$	AD
c_4	-2.5	
$\mathbf{n_5^\top}$	$\begin{pmatrix} -4 & 3.5 \end{pmatrix}$	BE
c_5	-8.5	
$\mathbf{n_6^\top}$	$\begin{pmatrix} -1 & -7 \end{pmatrix}$	CF
c_6	11	
G	$\begin{pmatrix} 0.67 \\ -1.67 \end{pmatrix}$	centroid of triangle

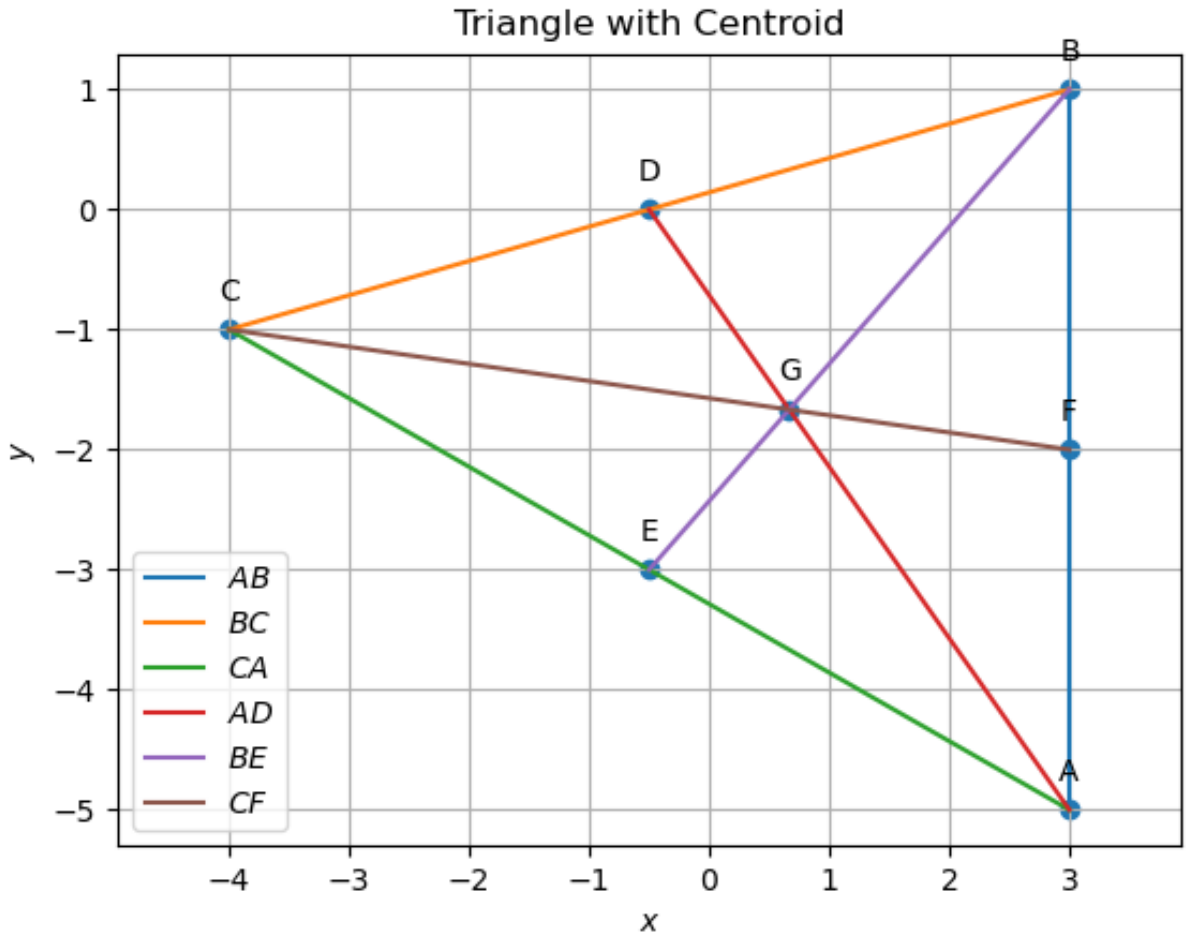

Fig. 0. Triangle ABC with medians AD, BE and CF

III. ALTITUDES

parameter	**value**	**description**
$\mathbf{n_7^\top}$	$\begin{pmatrix}-7 & -2\end{pmatrix}$	AD_1
c_7	-11	
$\mathbf{n_8^\top}$	$\begin{pmatrix}7 & -4\end{pmatrix}$	BE_1
c_8	17	
$\mathbf{n_9^\top}$	$\begin{pmatrix}0 & 6\end{pmatrix}$	CF_1
c_9	-6	
$\mathbf{H}$	$\begin{pmatrix}1.86 \\ -1\end{pmatrix}$	orthocentre of triangle

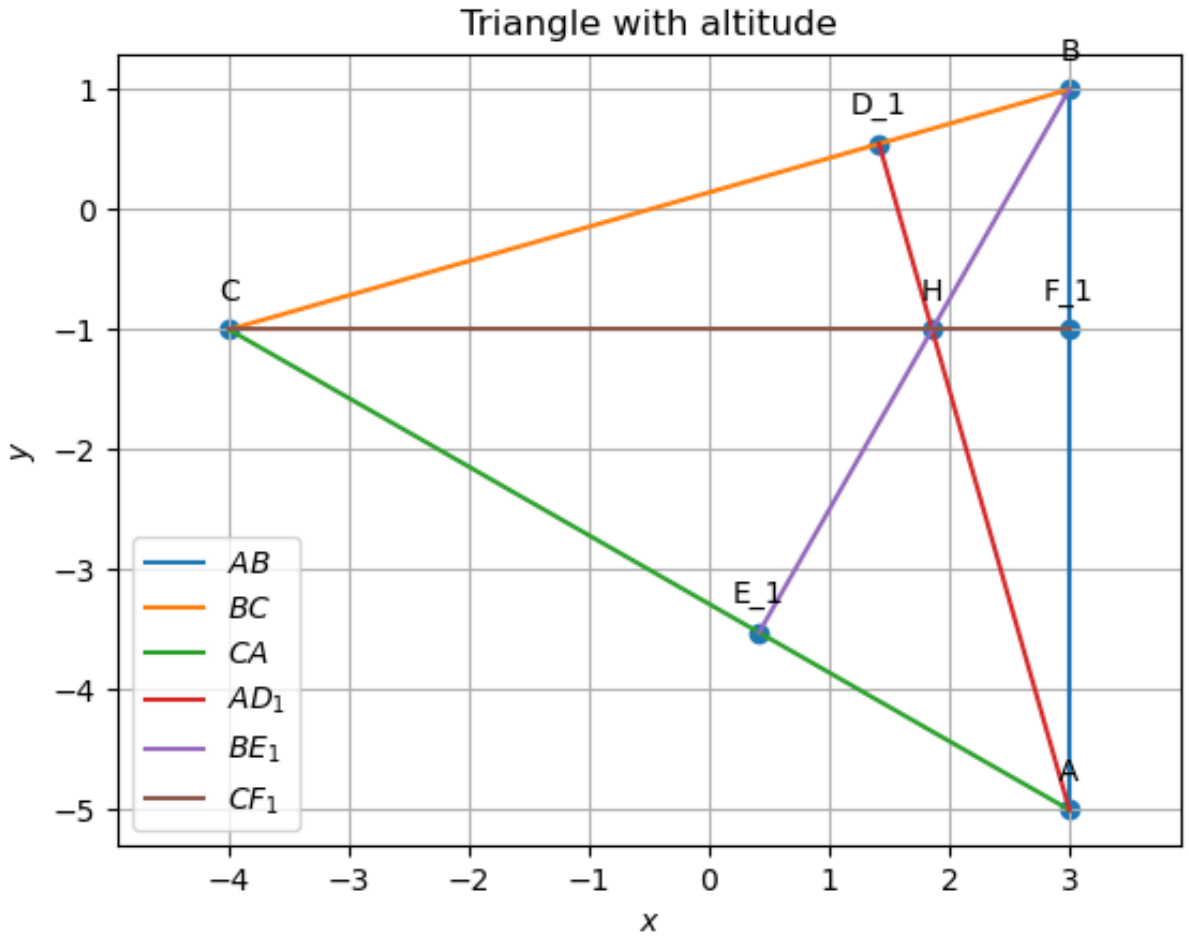

Fig. 0. Triangle ABC with altitudes AD_1, BE_1 and CF_1

IV. PERPENDICULAR BISECTOR

parameter	**value**	**description**
$n^\top$	(0 -6)	Perpendicular bisector of AB
c_{10}	-12	
$n^\top$	(7 2)	Perpendicular bisector of BC
c_{11}	3.5	
$n^\top$	(-7 4)	Perpendicular bisector of CA
c_{12}	8.5	
O	(0.07 -2)	Circumcircle
radius	4.19	

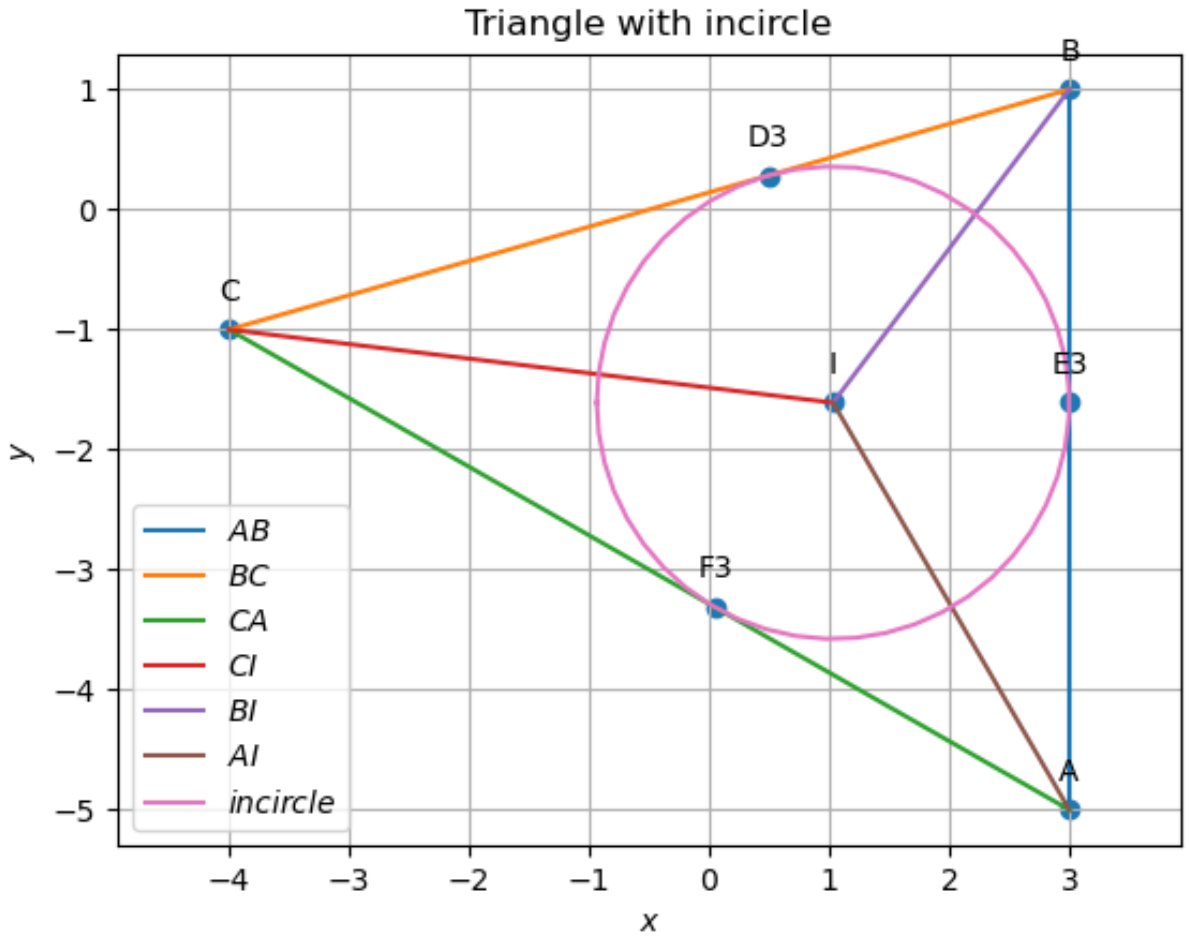

Fig. 0. circumcircle of triangle ABC with circumcentre O

V. ANGULAR BISECTOR

parameter	**value**	**description**
$n^\top$	(1.50 0.87)	Angular bisector of A
c_{13}	0.15	
$n^\top$	(-1.27 0.96)	Angular bisector of B
c_{14}	-2.86	
$n^\top$	(-0.22 -1.82)	Angular bisector of C
c_{15}	8.48	
I	(1.03 -1.60)	Incircle
radius	1.96	

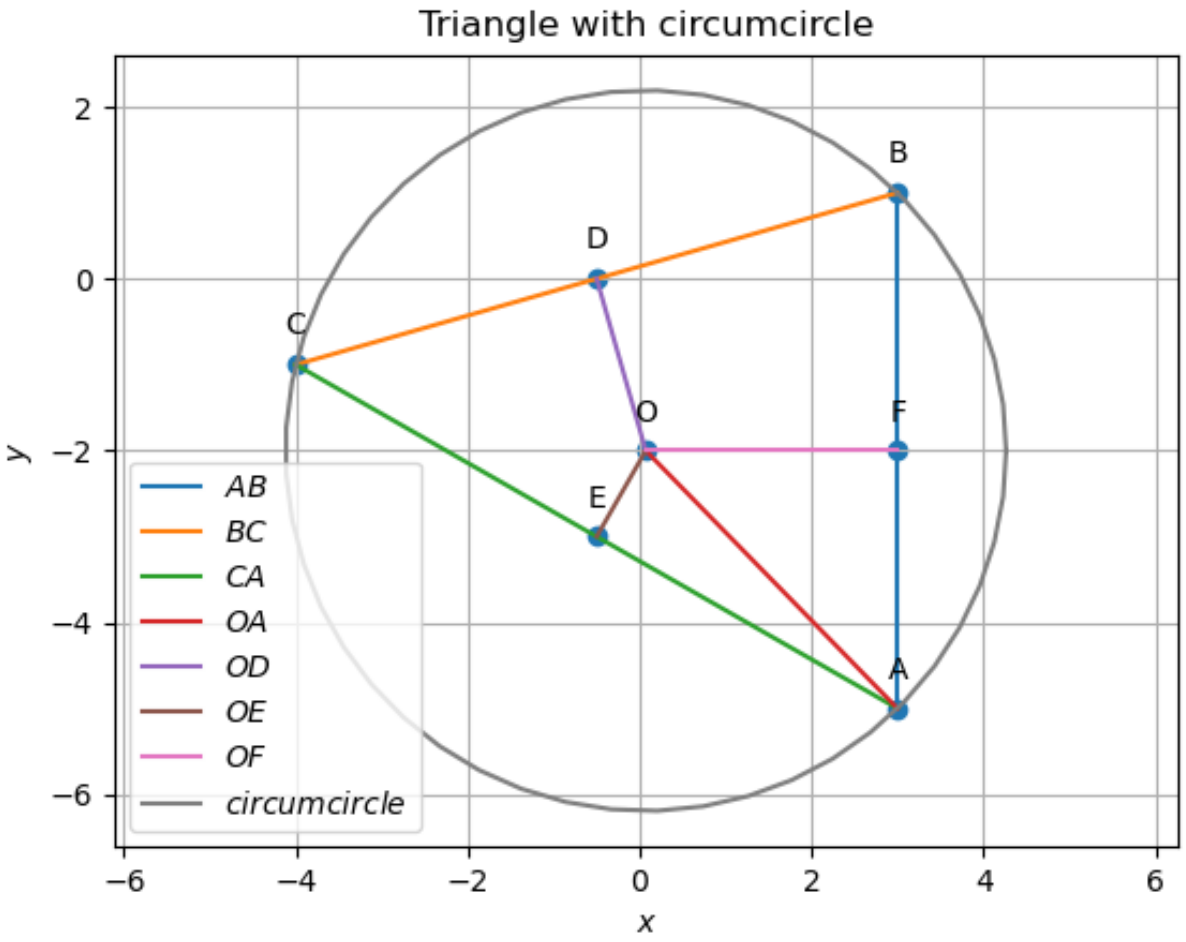

Fig. 0. incircle of triangle ABC with incentre I