

AI and ML

CH17BTECH11014 CH17BTECH11034

February 14, 2019

Question

Let k be an integer such that the triangle with vertices $(k, 3k)$ $(5, k)$ $(-k, 2)$ has area 28. Find the orthocentre of this triangle.

Answer

Let the points of the triangle be: $A=(k,-3k)$ $B=(5,k)$ $C=(-k,2)$

Area of triangle = $AB \times AC / 2$

Given, Area of triangle = 28

By solving the equations, we get the following quadratic Equation in 'k':

$$5k^2 + 13k - 46 = 0$$

Hence $k=2$ or $k=-4.6$

$$K=2$$

$$A=(2,-6) \quad B=(5,2) \quad C=(-2,2)$$

Let P,Q,R be the points of intersection of points with sides BC,CA,AB respectively.

Thus we can find the Orthocentre of triangle by calculating the point of intersection of AP and BQ.

$$\text{Orthocentre: } H=(2,0.5)$$

$$K=-4.6$$

$$A=(-4.6,13.8) \quad B=(5,-4.6) \quad C=(4.6,2)$$

Let P,Q,R be the points of intersection of points with sides BC,CA,AB respectively.

Thus we can find the Orthocentre of triangle by calculating the point of intersection of AP and BQ.

$$\text{Orthocentre: } H=(31.39,15.98)$$

Output

