

**Answer on Question #51345 - Math - Other**

**Question** the orthocenter of the triangle formed by (0,0),(5,-1),(-2,3) is

**Solution** Let us denote points as A(0,0), B(5,-1) and C(-2,3). Let us find slopes of AB, BC and CA:

$$AB : \frac{-1 - 0}{5 - 0} = -\frac{1}{5}$$

$$BC : \frac{3 - (-1)}{-2 - 5} = -\frac{4}{7}$$

$$CA : \frac{0 - 3}{0 - (-2)} = -\frac{3}{2}$$

Let us find the slope of the altitudes AD, BE and CF which are perpendicular to BC, CA and AB respectively.

$$AD : -\frac{1}{\text{slope of BC}} = \frac{7}{4}$$

$$BE : -\frac{1}{\text{slope of CA}} = \frac{2}{3}$$

$$CF : -\frac{1}{\text{slope of AB}} = 5$$

Now let us find equation of the line AD with point A(0,0) and the slope 7/4. Obviously its

$$y = \frac{7}{4}x$$

Now let us find equation of the line CF with point C(-2,3) and the slope 5. Obviously its

$$2(-5) + 13 = 3$$

$$y = 5x + 13$$

We can now find orthocenter solving system of equations

$$y = \frac{7}{4}x$$

$$y = 5x + 13$$

Coordinates of orthocenter is

$$(-4, -7)$$