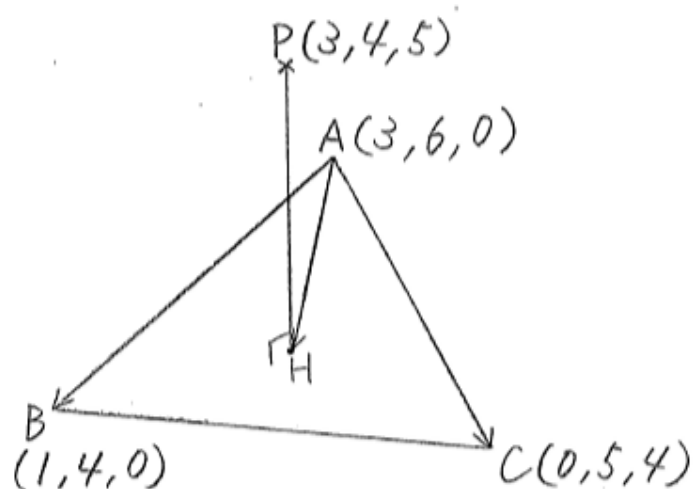


129



$$\vec{AB} = (-2, -2, 0)$$

$$\vec{AC} = (-3, -1, 4)$$

$$\vec{PA} = (0, 2, -5)$$

$$\vec{PB} = (-2, 0, -5)$$

$$\vec{PC} = (-3, 1, -1)$$

$$\vec{AH} = s\vec{AB} + t\vec{AC} \text{ とおく。}$$

$$\vec{PH} - \vec{PA} = s(\vec{PB} - \vec{PA}) + t(\vec{PC} - \vec{PA})$$

$$= s\vec{PB} - s\vec{PA} + t\vec{PC} - t\vec{PA}$$

$$\vec{PH} = (1-s-t)\vec{PA} + s\vec{PB} + t\vec{PC}$$

$$= (0, 2(1-s-t), -5(1-s-t)) + (-2s, 0, -5s) + (-3t, t, -t)$$

$$= (-2s-3t, 2-2s-t, -5+4t) \cdots \textcircled{1}$$

$$\vec{PH} \perp \vec{AB} \text{ より、}$$

$$\vec{PH} \cdot \vec{AB} = -2(-2s-3t) - 2(2-2s-t)$$

$$= 4s+6t-4+4s+2t$$

$$= 8s+8t-4=0$$

$$\boxed{2s+2t-1=0} \cdots \textcircled{2}$$

$$129 \vec{PH} \perp \vec{AC} \text{ より、}$$

$$\text{(続き)} \vec{PH} \cdot \vec{AC} = -3(-2s-3t) - (2-2s-t) + 4(-5+4t)$$

$$= 6s+9t-2+2s+t-20+16t$$

$$= 8s+26t-22=0$$

$$\boxed{4s+13t-11=0} \cdots \textcircled{3}$$

②, ③より

$$\begin{cases} 2s+2t-1=0 \\ 4s+13t-11=0 \end{cases} \rightarrow s = -\frac{1}{2}, t = 1$$

これらを①に代入する。

$$\therefore \vec{PH} = (-2, 2, -1)$$

$$|\vec{PH}| = \sqrt{(-2)^2 + 2^2 + (-1)^2} = \sqrt{9} = 3 \text{ (答)}$$