

Answer on Question #65756 – Math / Geometry

Find the coordinates of the foot of the perpendicular from $(3, -2)$ on the line $4x + 5y - 1 = 0$.

Solution.

1. Find perpendicular line:

$$\frac{x-3}{4} = \frac{y+2}{5};$$

$$5x - 15 = 4y + 8;$$

$$5x - 4y - 23 = 0;$$

2. Calculate set of equations:

$$\begin{cases} 4x + 5y - 1 = 0; \\ 5x - 4y - 23 = 0; \end{cases}$$

$$\begin{pmatrix} 4 & 5 & 1 \\ 5 & -4 & 23 \end{pmatrix};$$

$$\begin{pmatrix} 1 & 1.25 & 0.25 \\ 5 & -4 & 23 \end{pmatrix};$$

$$\begin{pmatrix} 1 & 1.25 & 0.25 \\ 5 & -10.25 & 21.75 \end{pmatrix};$$

$$\begin{pmatrix} 1 & 1.25 & 0.25 \\ 0 & 1 & -\frac{87}{41} \end{pmatrix};$$

$$\begin{pmatrix} 1 & 0 & \frac{119}{41} \\ 0 & 1 & -\frac{87}{41} \end{pmatrix};$$

$$\begin{cases} x = \frac{119}{41}; \\ y = -\frac{87}{41}; \end{cases}$$

Answer

Coordinates of the foot is $(\frac{119}{41}; -\frac{87}{41})$;

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