Answer on Question #75327 – Math – Analytic Geometry

Question

Find the coordinates of the foot of the perpendicular from (-2,6) on the line 2x+3y-1=0.

Solution

If y= kx+b is the equation of the perpendicular passing through (-2,6), so 6= -2k+b; k=(6-b)/(-2)

The equation 2x+3y-1=0 given in the question is rewritten in the following form:

$$y = -2x/3+1/3.$$

Because the two lines are perpendicular,

$$(6-b)/(-2)=-1/(-2/3)=3/2;\ b=9;\ k=(6-b)/(-2)=(6-9)/(-2)=3/2.$$

One gets y=3/2x+9 is the equation of the perpendicular to the line 2x+3y-1=0 passing through (-2,6).

Now we find the coordinates of the foot of the perpendicular:

-2x/3+1/3 = 3x/2+9;

x=-4; y=-2*(-4)/3+1/3=3.

Answer: (-4, 3).