Graphic Organizer for Problem-Based Courses Example

Restate the problem or question/determine the type of problem

Find the equation of the line perpendicular to the line $y = -5x + 2$ that passes through the point (3,-1).

Identify Knowns and Unknowns

Known

Line 1: $y = -5x + 2, M_1 = -5, b_1 = 2$

Line 2: passes through $(3, -1)$

Unknown

Slope 2: M_2=

Y-int. 2: b_2=

Identify Formula

$Y = Mx + b$, M is the slope, b is the Y-int; $M_2 = \frac{-1}{M_1}$

Other Notes

1 lines: Slopes are negative reciprocals $M_2 = \frac{-1}{M_1}$

To find the Answer.

Show your work and write an explanation for each step.

Step 1

Find M_2. $M_2 = \frac{-1}{M_1}$. $M_2 = \frac{-1}{-5} = \frac{1}{5}$. Find slope of line 2 from slope of line 1.

Step 2

Find b_2. $Y = \frac{1}{5}x + b$. Set up equation for line 2 with slope of line 2.

Step 3

$(3, -1) = (x, y)$, $-1 = \frac{1}{5}(3) + b$. Use the point $(3, -1)$ to find b (y-int) of line 2.

Step 4

$-1 = \frac{3}{5} + b$, $-1 - \frac{3}{5} = \frac{3}{5} - \frac{3}{5} + b$. Simplify.

Step 5

$-1 - \dfrac{3}{5} = b$, $-\dfrac{8}{5} = b$. Simplify to find b of line 2

Step 6

$Y = \dfrac{1}{5}x + (-\dfrac{8}{5})$, Use M$_2$ and b$_2$ to write equation!

Answer (Examine your answer. Is it correct? Is it reasonable?)

$$Y = \frac{1}{5}x - \frac{8}{5}$$

Additional Info

For more information, visit the Center for Academic Success in B-31 Coates Hall, call (225)578-2872, or visit lsu.edu/cas.