

Discrete Assignment

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Question

The perpendicular from the origin to the line $y = mx + c$ meets it at the point $(-1, 2)$. Find the values of m and c .

Solution

The slope of the line $y = mx + c$ is m . Therefore, the slope of the perpendicular line is the negative reciprocal of m , which is $-\frac{1}{m}$.

$$y - y_1 = m(x - x_1)$$

Substituting $x_1 = -1$, $y_1 = 2$, and $m = -\frac{1}{m}$, we get:

$$y - 2 = -\frac{1}{m}(x + 1)$$

$$y - 2 = -\frac{1}{m}x - \frac{1}{m}$$

$$y = -\frac{1}{m}x - \frac{1}{m} + 2$$

$$y = -\frac{1}{m}x + \left(2 - \frac{1}{m}\right)$$

Now, we can see that the value of c is $2 - \frac{1}{m}$.

$$0 = m(0) + c$$

$$c = 0$$

Now, equating the expressions for c , we have:

$$0 = 2 - \frac{1}{m}$$

$$\frac{1}{m} = 2$$

$$m = \frac{1}{2}$$

So, the values of m and c are $\frac{1}{2}$ and 0, respectively.