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| |  | | --- | |  |  |  | | --- | |  |   ***Solving "Ax + By = C" for "y=" (page 2 of 2)***  *Sections:* [*Solving for a given variable*](http://www.purplemath.com/modules/solvelit.htm)*, Solving for "y="*  Probably one of the more important classes of literal equations you will need to solve will be linear equations. For instance, it is common that you are given problems of this type:   * **What is the slope of the line with equation 3*x* + 2*y* = 8?**   In order to find the [slope](http://www.purplemath.com/modules/slope.htm), it is simplest to put this line equation into [slope-intercept form](http://www.purplemath.com/modules/strtlneq.htm). If I rearrange this line to be in the form "*y* = *mx* + *b*", it will be easy to read off the slope *m*. So I'll solve: Copyright © Elizabeth Stapel 1999-2009 All Rights Reserved  3*x* + 2*y* = 8  2*y* = –3*x* + 8  *y* = ( –3/2 ) *x* + 4  Then **the slope is *m* =  –3/2 .**  Warning: There are many contexts, such as [graphing](http://www.purplemath.com/modules/graphlin.htm) and [systems of equations](http://www.purplemath.com/modules/systlin1.htm), in which you will need to be able to solve a linear equation for "*y* =", so make sure you are comfortable with these techniques.   * **Find the slope and *y*-**[**intercept**](http://www.purplemath.com/modules/intrcept.htm) **of the line with equation 2*x* – *y* = 5.**   I'll solve for "*y* =":  2*x* – *y* = 5  2*x* = *y* + 5  2*x* – 5 = *y*  Then *y* = 2*x* – 5, and, from the slope-intercept form of *y* = *mx* + *b*, I can see that:  **the slope is *m* = 2 and the *y*-intercept is *b* = –5.**   * **Find the slope and *y*-intercept of the line with equation *x* – 2*y* = 5.**   I'll solve for "*y* =":  *x* – 2*y* = 5  *x* = 2*y* + 5  *x* – 5 = 2*y* ( 1/2 ) *x* – ( 5/2 ) = *y*  Then *y* = ( 1/2 ) *x* – ( 5/2 ), so:  **the slope is *m* =  1/2  and the *y*-intercept is *b* =  –5/2 .**   * **Find the slope and *y*-intercept of the line with equation 4*x* + 5*y* = 12.**   I'll solve for "*y* =":  4*x* + 5*y* = 12  5*y* = – 4*x* + 12  *y* = ( –4/5 ) *x* + ( 12/5 )  **Then the slope is *m* =  –4/5 and the *y*-intercept is *b* =  12/5 .**  Don't let literal equations "throw" you. Solving literal equations is *just* like solving linear (and other sorts of) equations, except that the answers don't simplify as much. The techniques involved are otherwise exactly the same. Just take your time and be sure to write out all your steps clearly. |