

Lesson: Rearranging from Standard Form ($Ax + By + C = 0$) to Slope-Intercept Form ($y = mx + b$)

When an equation is in slope-intercept form ($y=mx+b$) we can easily identify the slope and y-intercept. It also makes graphing the equation a quick task and allows us to easily enter equations into the graphing calculator.

To rearrange an equation to this form, solve the equation for y (get the y by itself).

1. Rearrange $2x - 2y + 1 = 0$ to slope/y-intercept form.

Steps	Work
<p>→ Isolate the 'y-term' by eliminating the other terms. Applying the opposite operation to both sides of the equation to do this.</p> <p>→ Write the x term first, and the constant term second (keeping with the form $y = mx + b$)</p> <p>→ Divide both sides by the coefficient of y. Be careful, it may be negative. When dividing an entire side by the coefficient, EVERY TERM must be divided.</p> <p>→ Place your fractions in lowest terms.</p>	$2x + 2y + 1 = 0$ $2x + 2y + 1 - 2x - 1 = 0 - 2x - 1$ $2y = -2x - 1$ $\frac{2y}{2} = \frac{-2x}{2} - \frac{1}{2}$ $y = -x - \frac{1}{2}$

***if the equation is in standard form ($=0$) and the coefficient of the 'y-term' is negative, try eliminating the 'y-term' first and see what happens...

2. Rearrange the following to slope/y-intercept form.

$x + 3y + 9 = 0$ $x + 3y + 9 - x - 9 = 0 - x - 9$ $3y = -x - 9$ $\frac{3y}{3} = \frac{-x}{3} - \frac{9}{3}$ $y = \frac{-1}{3}x - 3$	$2x + 5y = 0$ $2x + 5y - 2x = 0 - 2x$ $\frac{5y}{5} = \frac{-2x}{5}$ $y = \frac{-2}{5}x$	$5x - 3y = -4$ $5x - 3y - 5x = -4 - 5x$ $\frac{-3y}{-3} = \frac{-5x}{-3} - \frac{4}{-3}$ $y = \frac{5}{3}x + \frac{4}{3}$	$3x - y = 0$ $3x - y - 3x = 0 - 3x$ $\frac{-y}{-1} = \frac{-3x}{-1}$ $y = 3x$
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Practice: Rearranging the equation of a line into $y = mx + b$ form

Rearrange the following equations into $y = mx + b$ form

<p>a) $2x + y - 3 = 0$</p> $y = -2x + 3$	<p>b) $3x - y + 5 = 0$</p> $3x + 5 = y$ $y = 3x + 5$
<p>c) $9x - 5y + 5 = 0$</p> $\frac{9x+5}{5} = \frac{5y}{5}$ $\frac{9}{5}x + 1 = y$ $y = \frac{9}{5}x + 1$	<p>d) $4x - 3y + 6 = 0$</p> $\frac{4x+6}{3} = \frac{3y}{3}$ $\frac{4}{3}x + 2 = y$ $y = \frac{4}{3}x + 2$
<p>e) $3x - y = 7$</p> $\frac{-y}{-1} = \frac{-3x+7}{-1}$ $y = 3x - 7$	<p>f) $5x - y + 2 = 0$</p> $5x + 2 = y$ $y = 5x + 2$
<p>g) $-3y + 6x = 0$</p> $\frac{6x}{3} = \frac{3y}{3}$ $2x = y$ $y = 2x$	<p>h) $2x + 3y = -24$</p> $\frac{3y}{3} = \frac{-2x-24}{3}$ $y = \frac{-2}{3}x - 8$
<p>i) Paul's catering company charges according to the equation $250x - 10y + 2000 = 0$, where y represents the total cost and x represents the number of people. Rearrange this equation to determine his charge per person and fixed cost.</p> $\frac{250x + 2000}{10} = \frac{10y}{10}$ $25x + 200 = y$ <p>\therefore Paul charges \$25 per person and \$200 as a fixed cost.</p>	
<p>ANSWERS: a) $y = -2x + 3$, b) $y = 3x + 5$, c) $y = 9/5x + 1$, d) $y = 4/3x + 2$, e) $y = 3x - 7$, f) $y = 5x + 2$, g) $y = 2x$, h) $y = -2/3x - 8$, i) $y = 25x + 200$ (\$25 per person & \$200 fixed/initial fee).</p>	