Lesson 8 General Form of the Equation

Sometimes equations of lines are not given to us in a form that is easy to graph. For example, the general form: $Ax + By + C = 0$ ← general form

$Ax + By = C$ ← standard form

General Form of the Equation of a Linear Relation

$Ax + By + C = 0$, where A is a whole number, and B and C are integers.

always positive, not negative

Example 1 – Rewriting an Equation in General Form

$Ax + By + C = 0$

A, B, C coefficients

x, y variables

Write each equation in general form.

a) $y = -\frac{2}{3}x + 4$ ← slope-intercept form

multiply to get rid of fraction

$3y = -2x + 12$

$+2x \quad -12$

$2x + 3y - 12 = 0$

make A positive, one side zero

another one $y = \frac{3}{4}x - 5$

$4y = 3x - 20$

$0 = 3x - 4y - 20$ or $3x - 4y - 20 = 0$

slope-point form b) $y - 1 = \frac{3}{5}(x + 2)$

Multiply both sides by 5

$5y - 5 = 3(x + 2)$

$5y - 5 = 3x + 6$

Move everything to the right to make left 0 and keep A positive

$0 = 3x - 5y + 11$

or $3x - 5y + 11 = 0$

more examples

$3(y - 2) = 2(x - 3)$

$3y - 6 = 2x - 6$

$0 = 2x - 3y$

or $2x - 3y = 0$

Try $(y + 4) = -\frac{3}{4}(x - 1)$

$4y + 16 = -3x + 3$

$3x + 4y + 13 = 0$

Example 2 – Graphing a Line in General Form

Graph the line whose equation is: $3x + 2y - 18 = 0$

$3x + 2y - 18 = 0$

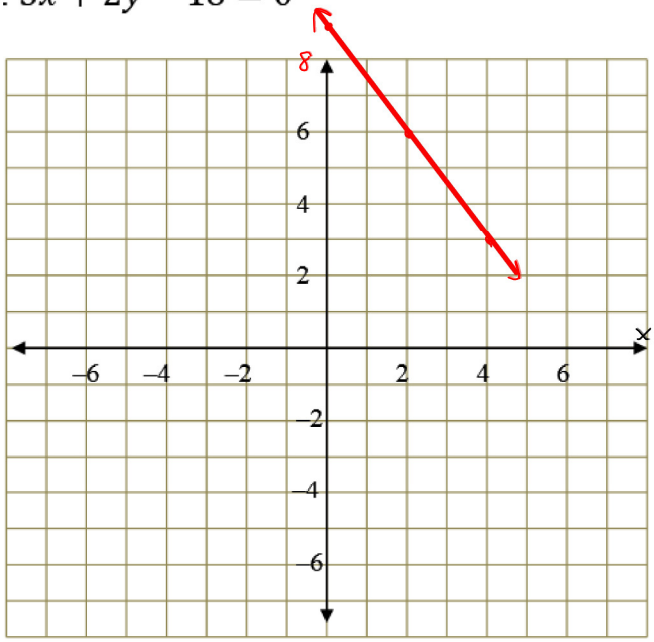
$2y = -3x + 18$

$y = -\frac{3}{2}x + 9$

change to slope-intercept form, $y = mx + b$

$m = -\frac{3}{2}$ ↑ y-int

down 3, right 2



Sometimes, we have to generate the equation from a graph of generated data.

Example 3

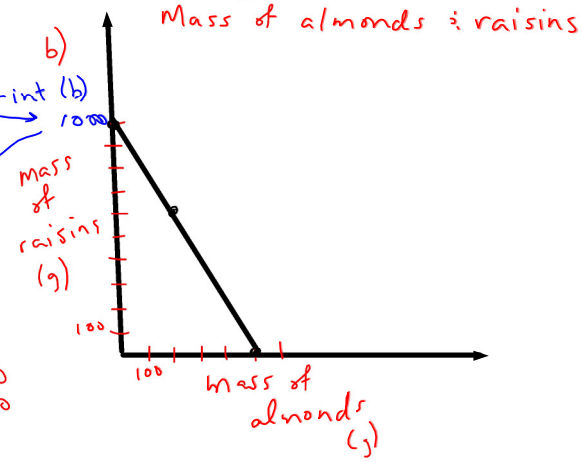
Almonds cost \$2 per 100g and raisins cost \$1 per 100g. Liam has \$10 to purchase both items.

a) Generate some data for the relation
b) Graph the data
c) Write an equation for the relation
d) Will Liam spend exactly \$10 if he buys 300g of almonds and 400g of raisins? What about 400g of almonds and 300g of raisins?

a)

mass of almonds (g)	mass of raisins (g)
500	0
0	1000
200	600

b)



c) $y = mx + b$

$m = -\frac{1000}{500}$

$= -2$

$y = -2x + 1000$

$r = -2a + 1000$

d) 300 g of almonds \$6
400 g of raisins \$4
\$10 yes

400 g of almonds \$8
300 g of raisins \$3
\$11 no

Worksheet

$y - 1 = \frac{3}{5}(x + 2)$

y_1 slope x_1

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

$y - 1 = \frac{3}{5}(x - (-2))$

y_1 x_1

pt $(-2, 1)$