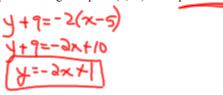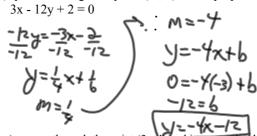Coordinate Geometry practice...
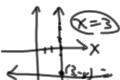
#1. Show that the triangle whose vertices have the coordinates (3, 3), (8, 17) & (11, 5) is a right triangle.

$M_{AB} = \frac{17-3}{8-3}$ $M_{BC} = \frac{17-5}{8-11}$

$= \frac{14}{5}$ $= \frac{12}{-3}$ $M_{AC} = \frac{5-3}{11-3}$

$\therefore BC \perp AC$ $= -4$ $= \frac{2}{8} = \frac{1}{4}$

#2. Determine the equation of the line... $y = mx + b$

a) passes through the point (5, -9) and is parallel to the line $2x + y = 1$

$y + 9 = -2(x - 5)$ $y = -2x + 1$

$y + 9 = -2x + 10$ $m = -2$

$\boxed{y = -2x + 1}$

b) passes through the point (-3, 0) and is perpendicular to the line
$3x - 12y + 2 = 0$

$\frac{-12y}{-12} = \frac{-3x}{-12} - \frac{2}{-12}$ $\therefore m = -4$

$y = \frac{1}{4}x + \frac{1}{6}$ $y = -4x + b$

$m = \frac{1}{4}$ $0 = -4(-3) + b$

$-12 = b$

$\boxed{y = -4x - 12}$

c) passes through the point (3, -4) and is perpendicular to the x-axis

$\boxed{x = 3}$

#3. For each pair of equations, find a value for k so that the...

a) graph of $4x + ky - 2 = 0$ is parallel to the graph of $3x - 2y = 5$

$ky = -4x + 2$ $-2y = -3x + 5$

$y = -\frac{4}{k}x + \frac{2}{k}$ $y = \frac{3}{2}x - \frac{5}{2}$

$-\frac{4}{k} = \frac{3}{2}$

$\frac{3k}{3} = \frac{-8}{3}$

b) graph of $4x + ky = 6$ is perpendicular to the graph of $5x - 2y + 5 = 0$

$ky = -4x + 6$ $-2y = -5x - 5$

$y = -\frac{4}{k}x + \frac{6}{k}$ $y = \frac{5}{2}x + \frac{5}{2}$

$m = -\frac{4}{k}$ $m = \frac{5}{2}$

$-\frac{4}{k} = \frac{-2}{5}$

$-2k = -20$

1

6.6 General Form of the Equation for a Linear Relation

(Standard Form)

General Form of the Equation of a Linear Relation

$Ax + By + C = 0$ is the general form of the equation of a line, where A is a whole number, and B and C are integers.

Example 1   Rewriting an Equation in General Form

Write each equation in general form.

a) $y = -\frac{2}{3}x + 4$ **(3)** **(3)** **(3)**

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

$3y = -2x + 12$

$2x + 3y - 12 = 0$

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

$5y - 5 = 3x + 6$

$0 = 3x - 5y + 11$

$\times 1 (- 3x + 5y - 11 = 0)$

$3x - 5y + 11 = 0$

6.6 General Form of the Equation for a Linear Relation

3

1. Write each equation in general form.

a) $y = -\dfrac{1}{4}x + 3$

b) $y + 2 = \dfrac{3}{2}(x - 4)$

a) $\overset{\times 4}{\left(\dfrac{1}{4}x + y - 3 = 0\right)}$

$x + 4y - 12 = 0$

b) $2y + 4 = 3x - 12$

$0 = 3x - 2y - 16$

4

Example 2   Graphing a Line in General Form

a) Determine the x- and y-intercepts of the line whose equation is: $3x + 2y - 18 = 0$

b) Graph the line.

c) Verify that the graph is correct.

a) x-Int: $(y = 0)$

$3x - 18 = 0$

$3x = 18$

$x = 6$

$(6, 0)$

y-Int: $(x = 0)$

$2y - 18 = 0$

$2y = 18$

$y = 9$

$(0, 9)$

(b)

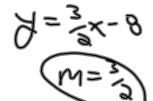6.6 General Form of the Equation for a Linear Relation

Example 3

Determining the Slope of a Line Given Its Equation in General Form

Determine the slope of the line with this equation:

$3x - 2y - 16 = 0$

$$\frac{-2y}{-2} = \frac{-3x}{-2} + \frac{16}{-2}$$

$$y = \frac{3}{2}x - 8$$

$$\boxed{m = \frac{3}{2}}$$

6.6 General Form of the Equation for a Linear Relation

Practice Problems...

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#4, 5, 6, 7, 8, 12, 13, 15, 18, 22, 23, 26,

$$3x - 2y + 7 = 0$$

$$3x - 2y = -7$$ (standard)