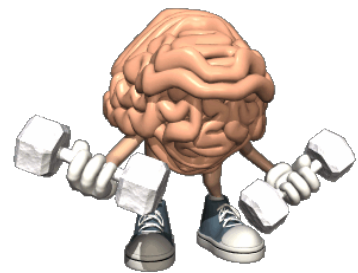1) A line that passes through (-7, 2) and (3, -1)

       a) Write an equation in point slope form:
       b) Write an equation in slope intercept form:

Warm Up Solutions

$x_1 \ y_1 \qquad x_2 \ y_2$

1) A line that passes through (-7, 2) and (3, -1)

    a) Write an equation in point slope form:
    b) Write an equation in slope intercept form:
    c) State the x and y intercept

$$M = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{(-1) - (2)}{(3) + (+7)}$$

$$\boxed{M = \frac{-3}{10}}$$

point $(-7, 2)$

$$y - y_1 = m(x - x_1)$$
$$y - 2 = \frac{-3}{10}(x - -7)$$

a) $y - 2 = \frac{-3}{10}(x + 7)$

OR distribute
through first

$y - 2 = \frac{-3}{10}(x + 7)$
$y - 2 = \frac{-3}{10}x - \frac{21}{10} \cdot 10$

$10y - 20 = -3x - 21$

$10y - 20^{+20} = -3x - 21^{+20}$

$10y = -3x - 1$

$\frac{10y}{10} = \frac{-3x}{10} - \frac{1}{10}$

$y = \frac{-3}{10}x - \frac{1}{10}$

$10\left[y - 2\right] = \left[\frac{-3}{10}(x + 7)\right]10$

$\underbrace{(\frac{-3}{10}x - \frac{21}{10})}$

$10[y - 2] = -3(x + 7)$

$10y - 20^{+20} = -3x - 21 + 20$

$10y = -3x - 1$

$\frac{10y}{10} = \frac{-3x}{10} - \frac{1}{10}$

b) $\boxed{y = \frac{-3}{10}x - \frac{1}{10}}$

6.6 General Form of the Equation for a Linear Relation

LESSON FOCUS | Relate the graph of a linear function to its equation in general form.

Make Connections

A softball team may field any combination of 9 female and male players.
There must be at least one female and one male on the field at any time.
What are the possible combinations for female and male players on the field?

Linear Equations

Slope Intercept Form

$$y = mx + b$$

Point Slope Form

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

Two other forms of LinearEquations

Standard

$$Ax + By = C$$

- Where A,B and C are integers

Example:
$$2x + 7y = 10$$

- -

General

$$Ax + By + C = 0$$

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:
$$2x + 7y - 10 = 0$$

Point - Slope to General Form

Method 1: distribute through

$$y - 3 = \frac{2}{5}(x + 6)$$

Point - Slope to General Form

Method 2: Get rid of denominator by multiplying each side by denominator

$$y - 3 = \frac{2}{5} (x + 6)$$

You try

Point - Slope to General Form

$$y + 6 = \frac{-3}{7}(x - 2)$$

Slope Intercept to General Form

a) $y = -\dfrac{2}{3}x + 4$
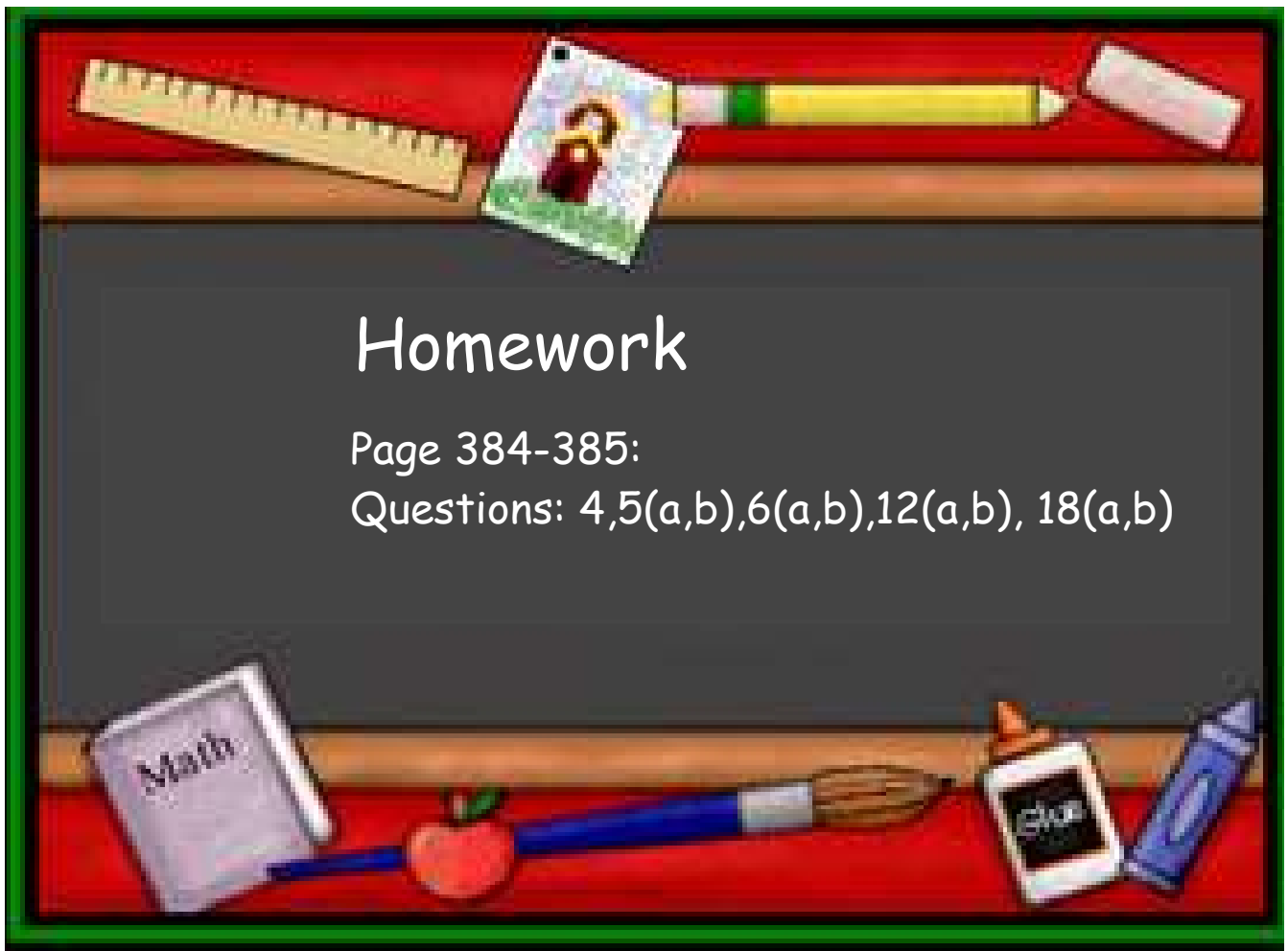
General Form to Slope Intercept

$7x - 2y + 18 = 0$

step 1) Locate y and take it to the side so it is positive

You try

General Form to Slope Intercept

$$3x + 4y - 12 = 0$$

Homework

Page 384-385:
Questions: 4,5(a,b),6(a,b),12(a,b), 18(a,b)

4. In which form is each equation written?

a) $8x - 3y = 52$ b) $9x + 4y + 21 = 0$

c) $y = 4x + 7$ d) $y - 3 = 5(x + 7)$

5. Determine the x-intercept and the y-intercept for the graph of each equation.

a) $8x - 3y = 24$ b) $7x + 8y = 56$

c) $4x - 11y = 88$ d) $2x - 9y = 27$

6. Write each equation in general form.
 a) $4x + 3y = 36$ **b)** $2x - y = 7$
 c) $y = -2x + 6$ **d)** $y = 5x - 1$

12. Write each equation in slope-intercept form.
 a) $4x + 3y - 24 = 0$ **b)** $3x - 8y + 12 = 0$
 c) $2x - 5y - 15 = 0$ **d)** $7x + 3y + 10 = 0$

18. Write each equation in general form.
 a) $y = \frac{1}{3}x - 4$ **b)** $y - 2 = \frac{1}{3}(x + 5)$

 c) $y + 3 = -\frac{1}{4}(x - 1)$ **d)** $y = -\frac{3}{2}x + \frac{4}{3}$

Solutions to Page 384-385:
Questions: 4,5(a,b),6(a,b),12(a,b), 18(a,b)

4. In which form is each equation written?

⭐a) $8x - 3y = 52$

Standard

⭐b) $9x + 4y + 21 = 0$

General

⭐c) $y = 4x + 7$

Slope Intercept

⭐d) $y - 3 = 5(x + 7)$

Point Slope

Solutions to Page 384-385:

Questions: 4,5(a,b),6(a,b),12(a,b), 18(a,b)

5. Determine the x-intercept and the y-intercept for the graph of each equation.

⭐a) $8x - 3y = 24$

xint → y=0

$8x - 3(0) = 24$

$8x = 24$

$x = \dfrac{24}{8}$

$x = 3$

$(3, 0)$

yint → x=0

$8(0) - 3y = 24$

$-3y = 24$

$y = \dfrac{24}{-3}$

$y = -8$

$(0, -8)$

⭐b) $7x + 8y = 56$

xint → y=0

$7x + 8(0) = 56$

$7x = 56$

$x = \dfrac{56}{7}$

$\boxed{x = 8}$

$(8, 0)$

yint → x=0

$7(0) + 8y = 56$

$8y = 56$

$y = \dfrac{56}{8}$

$y = 7$

$(0, 7)$

c) $4x - 11y = 88$

x int → y=0

$4x - 11(0) = 88$

$4x = 88$

$x = \dfrac{88}{4}$

$x = 22$

$(22, 0)$

y int → x=0

$4(0) - 11y = 88$

$-11y = 88$

$y = \dfrac{88}{-11}$

$y = -8$

$(0, -8)$

d) $2x - 9y = 27$

x int → y=0

$2x - 9(0) = 27$

$2x = 27$

$x = \dfrac{27}{2}$

$\left(\dfrac{27}{2}, 0\right)$

y int → x=0

$2(0) - 9y = 27$

$-9y = 27$

$y = \dfrac{27}{-9}$

$y = -3$

$(0, -3)$

6. Write each equation in general form.

a) $4x + 3y = 36$ $^{-36}$ $^{-36}$

4x +3y -36 =0

b) $2x - y = 7$ $^{-7}$ $^{-7}$

2x - y - 7=0

c) $y = -2x + 6$

2x + y - 6 =0

d) $y = 5x - 1$

5x - y -1 =0

$-2x - y + 6 = 0$

$2x + y - 6 = 0$

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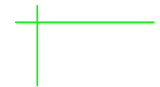
$y = mx + b$

12. Write each equation in slope-intercept form.

⭐ a) $4x + \boxed{3y} - 24 = 0$

$3y = -4x + 24$

$y = \dfrac{-4x}{3} + \dfrac{24}{3}$

$$\boxed{y = \dfrac{-4}{3}x + 8}$$

⭐ b) $3x - 8y + 12 = 0$

$-8y = -3x - 12$

$y = \dfrac{-3}{-8}x - \dfrac{12}{-8}$

$$\boxed{y = \dfrac{3}{8}x + \dfrac{3}{2}}$$

c) $2x - 5y - 15 = 0$

$-5y = -2x + 15$

$y = \dfrac{-2x}{-5} + \dfrac{15}{-5}$

$$\boxed{y = \dfrac{2}{5}x - 3}$$

d) $7x + 3y + 10 = 0$

$3y = -7x - 10$

$$\boxed{y = \dfrac{-7}{3}x - \dfrac{10}{3}}$$

NRF 10 Ch 6 Lesson 5 of e learning General form SMART lesson.notebook

Solutions to Page 384-385:
Questions: 4,5(a,b),6(a,b),12(a,b), 18(a,b)

18. Write each equation in general form.

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

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

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

d) $y = -\frac{3}{2}x + \frac{4}{3}$

⭐ a) $y = \underline{1}\, x - 4$
        3

$y = \underline{1}\, x - 4$ now get rid of
    3 denominator by
                    multiplying all terms
                    by that denominator

$3y = x - 12$

x is positive so move

all terms to this side

$3y = x - 12$

$0 = x - 3y - 12$

⭐ b) $y - 2 = \underline{1}\,(x + 5)$
            3

$y - 2 = \underline{1}\, x + \underline{5}$ now get rid of
        $3 \quad 3$ denominator by
                        multiplying all terms
                        by that denominator

$y - 2 = \underline{1}\, x + \underline{5}$
        $3 \quad 3$

$3y - 6 = 1 x + 5$

$3y - 6 = 1 x + 5$

x is positive so move

all terms to this side

$3y - 6 = 1 x + 5$

$0 = 1 x - 3y + 11$

18. Write each equation in general form.

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

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

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

d) $y = -\frac{3}{2}x + \frac{4}{3}$

c)   y + 3 = -1 (x - 1)

              4

y + 3= - 1 x + 1   now get rid of

      4   4   denominator by
multiplying all terms

by that denominator

$y^{x4} + 3^{x4} = -1^{x}x + 1_{xy}$

    4   4

4y +12 = -1 x + 1

4y +12 = -1 x + 1

x is NOT positive so move

all terms to other side to make x positive

$^{+1x}$4y +12 = -1 x + 1^{-1}

1x + 4y +11 = 0

18)

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

$y^{\times 6} = -\dfrac{3}{2}^{\times 6}x + \dfrac{4}{3}^{\times 6}$

now get rid of denominator by multiplying all terms by that common denominator

$6y = -\dfrac{18}{2}x + \dfrac{24}{3}$

Now divide out the fraction

$6y = -9x + 8$

x is NOT positive so move

all terms to other side to make x positive

$^{+9x}6y = -9x^{+9x} + 8^{-8}$

$9x + 6y - 8 = 0$