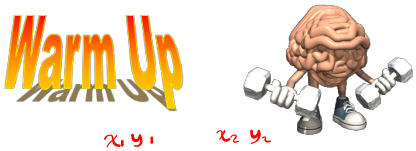


$x_1, y_1$ $x_2, y_2$

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

a) $m = \frac{y_2 - y_1}{x_2 - x_1}$

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

$m = \frac{-3}{10}$ Point $(-7, 2)$

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

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

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

b) $y - 2 + 2 = \frac{-3}{10}x - \frac{21}{10} + \frac{2}{1} \times \frac{10}{10}$ Common Denominators

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

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

$y = mx + b$

c) x-intercept (let $y = 0$)

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

$10(0) = \left(\frac{-3}{10}x - \frac{1}{10}\right) \times 10$

$0 = \frac{-30}{10}x - \frac{10}{10}$

$0 + 1 = -3x - 1 + 1$

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

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

$0 + \frac{1}{10} = \frac{-3}{10}x - \frac{1}{10} + \frac{1}{10}$

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

$-30x = 10$

$\frac{-30x}{-30} = \frac{10}{-30}$

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

$y = mx + b$

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

or let $x = 0$

$y = \frac{-3}{10}(0) - \frac{1}{10}$

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

# Homework Solutions

1)

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

$y-8 = 2\ (x-\ -1)$

$y-8 = 2(x+1)$

$y-8 = 2x + 2$

$y-8 + 8 = 2x + 2 +8$

$y = 2x + 10$

2)

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

$y--3 = 4\ (x-\ 6)$

$y+3 = 4(x-6)$

$y + 3 = 4x - 24$

$y+3-3 = 4x -24-3$

$y = 4x -27$

3)

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

$y--6 = \frac{3}{4}\ (x-\ -1)$

$y+6 = \frac{3}{4}(x+1)$

$y+6 = \frac{3}{4}x+ \frac{3}{4}$

$y+6-6 = \frac{3}{4}x+ \frac{3}{4} -6$

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

$y = \frac{3}{4}x - \frac{21}{4}$

4)

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

$y-1 = -3\ (x-\ -1)$

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

$y-1 = -3x-3$

$y-1+1 = -3x-3 +1$

$y = -3x -2$

6)

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

$m = \frac{1 - (-2)}{(-4) - (3)}$

$m = \frac{1+2}{(-4) - (3)}$

$m = \frac{3}{-7}$

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

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

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

$y+2 = \frac{-3}{7}x+ \frac{9}{7}$

$y+2-2 = \frac{-3}{7}x+ \frac{9}{7} -2$

$y = \frac{-3}{7}x+ \frac{9}{7} -\frac{14}{7}$

$y = \frac{-3}{7}x - \frac{5}{7}$

$(-4, 1)$ $\quad -\frac{3}{7}$

$y - 1 = -\frac{3}{7}(x + 4)$

$y - 1 = -\frac{3}{7}x - \frac{12}{7} + 1$ $\quad +1$

$y = -\frac{3}{7}x - \frac{12}{7} + \frac{7}{7}$

$7\left(y = -\frac{3}{7}x - \frac{5}{7}\right)7$

Standard

$Ax + By = C$

$7y = -3x - 5$

$C$

$+3x \quad 7y = -3x - 5$

Standard

$3x + 7y = -5$

$3x + 7y \overset{+5}{=} -5 + 5$

$3x + 7y + 5 = 0$ General

# 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?

Slope-intercept

$$y = mx + b$$

Slope-Point Equation

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

# 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:

$2x + 7y = 10$

$Ax + By = C$

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## 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:

$2x + 7y - 10 = 0$

$Ax + By + C$

# Point - Slope to General Form

Method 1: distribute through

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

$y - 3 = \frac{2x}{5} + \frac{12}{5}$

$y - 3 + 3 = \frac{2x}{5} + \frac{12}{5} + \frac{3}{1}$

$y = \frac{2}{5}x + \frac{12}{5} + \frac{15}{5}$

$y = \frac{2}{5}x + \frac{27}{5}$ Slope intercept form

$(5)\, y = \frac{2}{5}x(5) + \frac{27}{5}(5)$

$5y = 2x + 27$

$5y - 2x = 27$ Standard form

$5y - 2x - 27 = 27 - 27$

$5y - 2x - 27 = 0$ General form

$5 \cdot y - 3 \cdot 5 = \frac{2x}{5} \cdot 5 + \frac{12}{5} \cdot 5$

$5y - 15 + 15 = 2x + 12 + 15$

$5y = 2x + 27$

# Point - Slope to General Form

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

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

$5y - 15 = 2(x + 6)$

$5y - 15 = 2x + 12$

$5y - 15 \overset{+15}{} = 2x + 12 \overset{+15}{}$

$5y = 2x + 27$ $\quad -2x \quad -2x$

$-2x + 5y = 27$

$-2x + 5y \overset{-27}{} = 27 - 27$

$-2x + 5y - 27 = 0$

You try

# Point - Slope to General Form

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

$7(y+6) = -3(x-2)$

$7y + 42 = -3x + 6$

$7y + 42 - 42 = -3x + 6 - 42$

$7y = -3x - 36 - 7y$

$0 = -3x - 7y - 36$

$3x + 7y + 36 = 0$

# Slope Intercept to General Form

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

$y^{x3} = \frac{-2}{3}x + 4^{x3}$

$3y = -2x + 12$

$0 = -2x - 3y + 12$



$7x - 2y + 18 = 0$ $+2y$ $+2y$

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

$$\frac{7x + 18}{2} = \frac{2y}{2}$$

$$\frac{7}{2}x + \frac{18}{2} = y$$

Reduce

$$\frac{7}{2}x + 9 = y$$

# Homework

Page 384-385:

Questions: 4,5,6,~~7~~,~~8~~,12 a b, 18 a b

9 b 9 o

$y = mx + b$ slope intercept

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

$Ax + By = C$ Standard

$Ax + By + C = 0$ General

Test TUESDAY