Do Now

Graph each linear equation:

$2x - 6y = 10$ $3x = \frac{1}{2}y + 2$ $3x + 15 = -7$

Algebra 2

Ch. 2 Handout 2.2 (day 2)

Writing equations of lines

Standard form of a linear equation -- $Ax + By = C$

Ex: $2x + 5y = 9$

For a linear equation to be in standard form it must meet these four conditions:

Two ways to writing equations of a line:

Pull

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

m = slope

point = (x_1, y_1)

need to know slope and point

Pull

Using Point-Slope Form -- $y - y_1 = m(x - x_1)$

Writing an Equation Given the Slope and a Point Write in standard form an equation of the line with slope 3 through the point (-1, 5).

Write a Linear Equation → $y - y_1 = m(x - x_1)$

$m = 3$

$pt = (-1, 5)$ x_1, y_1

$y - 5 = 3(x - (-1))$

$y - 5 = 3(x + 1)$

$y - 5 = 3x + 3$

$+5 \quad +5$

$y = 3x + 8$ (slope-intercept form)

$-3x \quad -3x$

Write L.E. in Standard form

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

$\boxed{3x - y = -8}$ (standard form)

Using Point-Slope Form -- $y - y_1 = m(x - x_1)$

Writing an Equation Given Two Points Write in slope-intercept form an equation of the line through (4, -3) and (5, -1).

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

$m = \frac{-1 - (-3)}{5 - 4} = \frac{-1+3}{1} = \frac{2}{1} = 2$

Write L.E → $y - y_1 = m(x - x_1)$

$y - (-3) = 2(x - 4)$

$m = 2$

$pt = (4, -3)$ (x_1, y_1)

$y + 3 = 2x - 8$

$-3 \quad -3$

$y = 2x - 11$ (slope-intercept form)

1. Write in standard form the equation of each line.

~~a) slope 2, through (4, -2)~~

b) slope $\frac{5}{6}$, through (5, 6)

Write L.E → $y - y_1 = m(x - x_1)$

$m = \frac{5}{6}$

pt $(5, 6)$ x_1, y_1

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

$y - 6 = \frac{5}{6}x - \frac{25}{6} + \frac{6(6)}{1(6)}$

$+6$

$y = \frac{5}{6}x - \frac{25}{6} + \frac{36}{6}$

$y = \frac{5}{6}x + \frac{11}{6}$ (slope-intercept form)

Write L.E in standard form →

$-\frac{5}{6}x \quad -\frac{5}{6}x$

$6\left(-\frac{5}{6}x\right) + 6(y) = 6\left(\frac{11}{6}\right)$

$-5x + 6y = 11$

$5x - 6y = -11$ (standard form)

2. Write in slope-intercept form the equation of the line through each pair of poi

~~a) (5,0) and (-3, 2)~~

b) (5, 1) and (-4, -3)

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

$m = \frac{-3-1}{-4-5} = \frac{-4}{-9} = \frac{4}{9}$

Write L.E → $y - y_1 = m(x - x_1)$

$m = \frac{4}{9}$

$y - 1 = \frac{4}{9}(x - 5)$

$pt = (5, 1)$ (x_1, y_1)

$y - 1 = \frac{4}{9}x - \frac{20}{9} + \frac{1(9)}{1(9)}$

$+1$

$y = \frac{4}{9}x - \frac{20}{9} + \frac{9}{9}$

$\boxed{y = \frac{4}{9}x - \frac{11}{9}}$

(slope-intercept form)

6. Write an equation for each line.

a) through(-1, 3) and perpendicular to the line -5x + y = -3

Find m

$-5x + y = -3$

$+5x \quad +5x$

$y = 5x - 3$

$m = 5$

Write L.E of a line $\perp$ to given equation

$m_\perp = -\frac{1}{5}$

pt: $(-1, 3)$ x_1, y_1

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

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

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

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

$+3 \quad +3$

$y = -\frac{1}{5}x - \frac{1}{5} + \frac{15}{5}$

$y = -\frac{1}{5}x + \frac{14}{5}$

6. Write an equation for each line.

b) through (2, 1) and parallel to the line $-16x + 24y = 15$.

Find m

$-16x + 24y = 15$

$+16x \qquad +16x$

$\frac{24y}{24} = \frac{16x}{24} + \frac{15}{24}$

$y = \frac{2}{3}x + \frac{5}{8}$

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

Write L.E of a line || to given equation

$m_{\parallel} = \frac{2}{3}$

pt $(2, 1)$ (x_1, y_1)

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

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

$y - 1 = \frac{2}{3}x - \frac{4}{3} + \frac{3}{3}$

$+1$

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

Write the equation in slope-intercept form given slope is -4 and y-intercept is 7.

$m = -4$

x_1, y_1

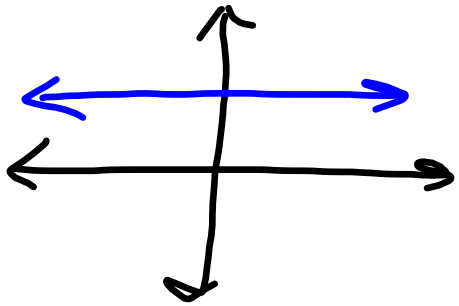
$pt = (0, 7)$

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

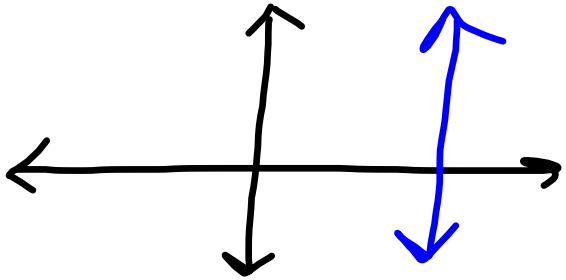
$y - 7 = -4(x - 0)$

$y - 7 = -4x$

$y = -4x + 7$

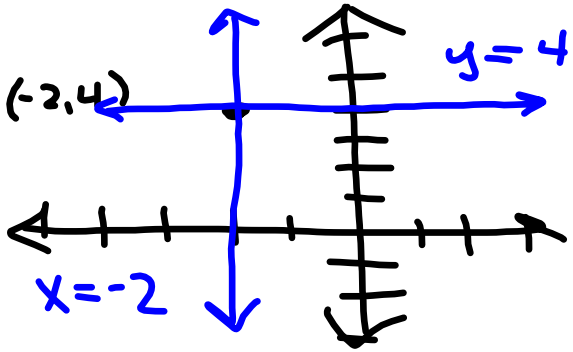


y = y-coord.



X = x-coord.

Write a linear equation of a Horizontal line and a Vertical line going through pt (-2, 4).



Horizontal line ⇒ $y = 4$

Vertical line ⇒ $x = -2$

Using Slope-Intercept Form $y = mx + b$

3. **Writing an Equation Given the Slope and a Point** Write in standard form an equation of the line with slope -2 through the point (3, 5).

Using Slope-Intercept Form $y = mx + b$

4. **Writing an Equation Given Two Points** Write in slope-intercept form an equation of the line through (4, -3) and (5, -1).

5. Find the slope of each line.

a) $-7x+2y=8$

b) $3x+2y=1$

5. Find the slope of each line.

c) $\frac{2}{3}x + \frac{1}{2}y = 1$

d) $Ax + By = C$

Write an equation for each line.

a) through(-1, 3) and perpendicular to the line-x + 2y = -3

Write an equation for each line.

a) through(-1, 3) and parallel to the line-x + 2y = -3

Assignment

Day 1: Pgs 67-70 21-31 odds, 39,
41, 67, 71-77 odds, 85-89 odds