

Math 115

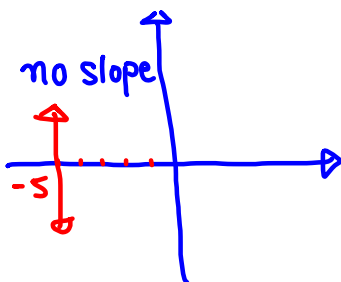
Fall 2017

Lecture 11

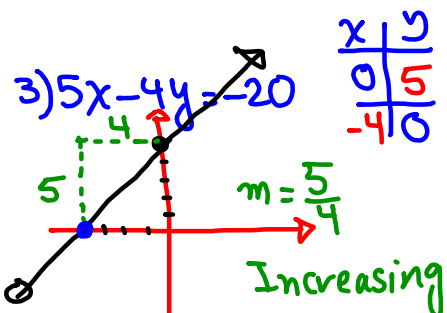
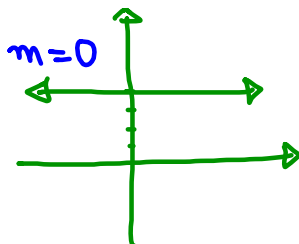


Draw

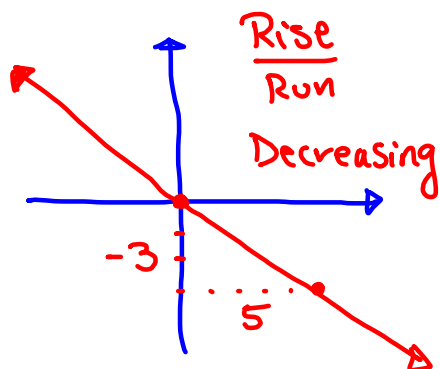
1) $x = -5$
V.L.



2) $y = 4$
H.L.



4) $y = -\frac{3}{5}x + 0$



$$A(-2, 7) \quad B(4, -1)$$

1) find distance

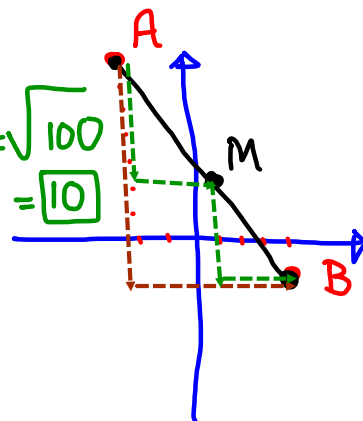
$$d = \sqrt{(-2 - 4)^2 + (7 - (-1))^2} = \sqrt{(-6)^2 + (8)^2} = \sqrt{100} = \boxed{10}$$

2) find midpoint

$$M\left(\frac{-2 + 4}{2}, \frac{7 + (-1)}{2}\right) = M(1, 3)$$

3) find slope

$$m = \frac{7 - (-1)}{-2 - 4} = \frac{8}{-6} = \boxed{\frac{-4}{3}}$$



Point-slope formula

$$y - y_1 = m(x - x_1) \quad \text{Point } (x_1, y_1)$$

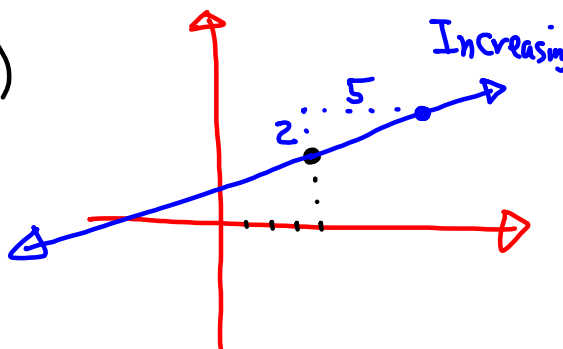
Slope m

Graph

$$y - 3 = \frac{2}{5}(x - 4)$$

Point (4, 3)

$$m = \frac{2}{5} \quad \frac{\text{Rise}}{\text{Run}}$$

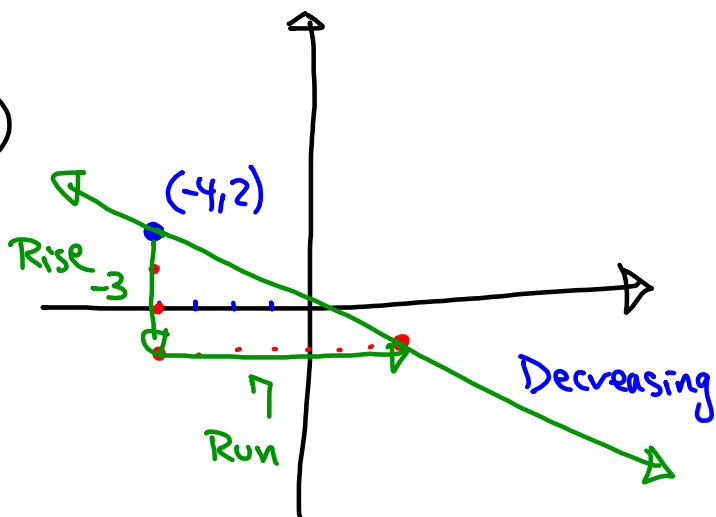


Graph

$$y - 2 = \frac{-3}{7}(x + 4)$$

Point $(-4, 2)$

$$m = \frac{-3}{7} \quad \begin{matrix} \text{Rise} \\ \text{Run} \end{matrix}$$



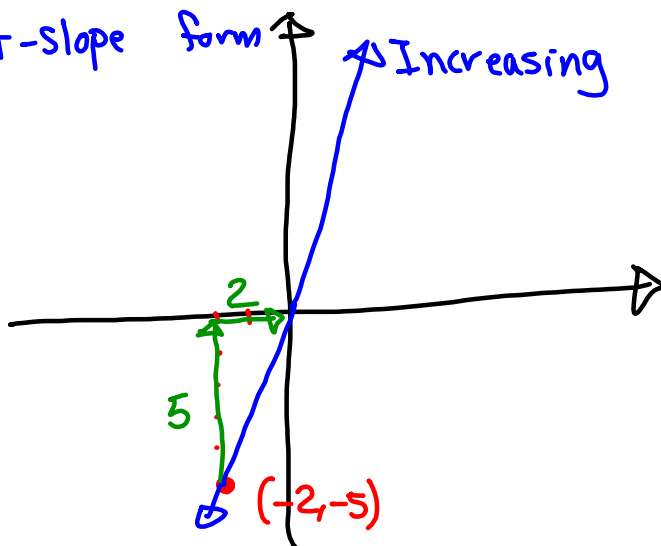
Graph

Point-slope form

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

Point $(-2, -5)$

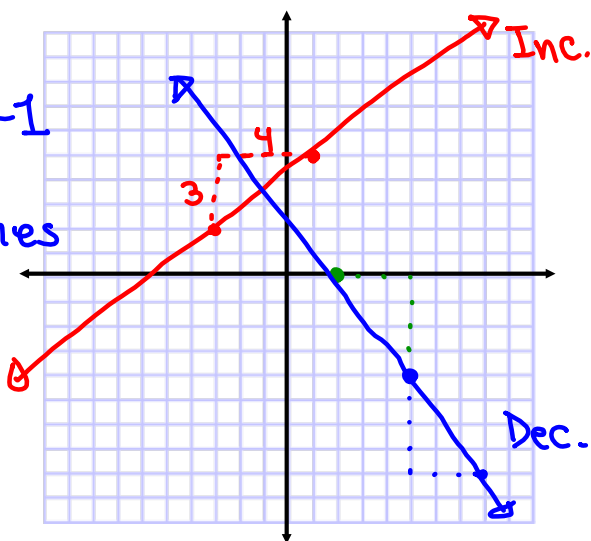
$$m = \frac{5}{2} \quad \begin{matrix} \text{Rise} \\ \text{Run} \end{matrix}$$

 $m = 0$ H.L. $m > 0$ IncreasingNo slope
undefined slope V.L. $m < 0$ Decreasing

Graph $y-2=\frac{3}{4}(x+3)$ & $y+4=\frac{-4}{3}(x-5)$

$$\frac{3}{4} \cdot \frac{-4}{3} = -1$$

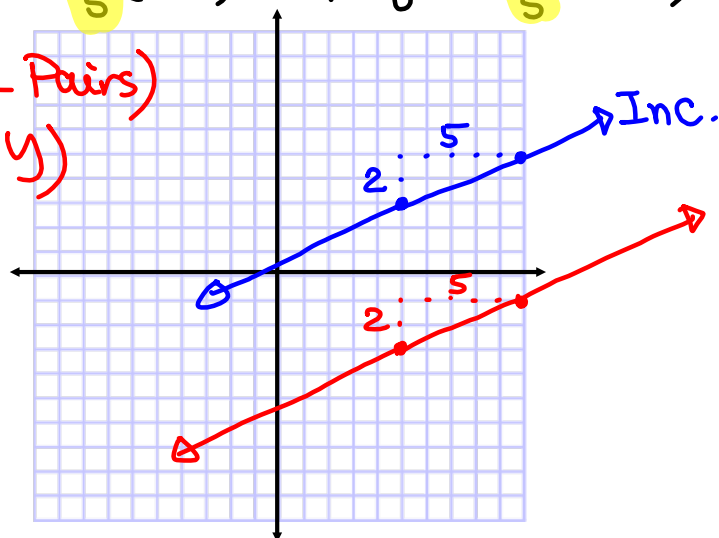
Two lines
are \perp .



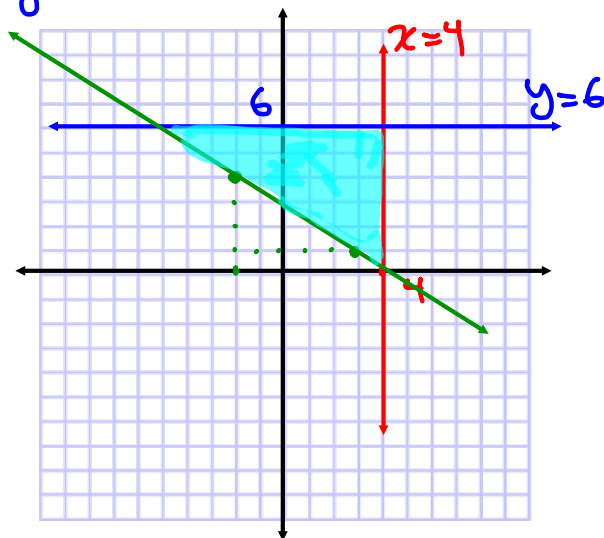
$$\frac{-4}{3} = \frac{4}{-3}$$

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

ordered-Pairs)
(x, y)



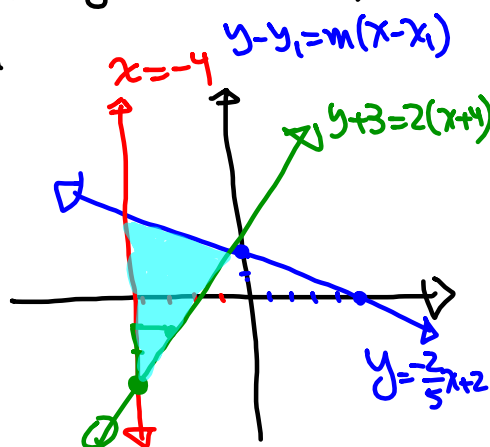
Graph $x=4$, $y=6$, and $y-4=-\frac{3}{5}(x+2)$.
Shade the region bounded(enclosed) by all three lines.



Graph $y=\frac{2}{5}x+2$, $x=-4$, $y+3=2(x+4)$

shade the region enclosed
by all the three lines.

$$m=2=\frac{2}{1}$$



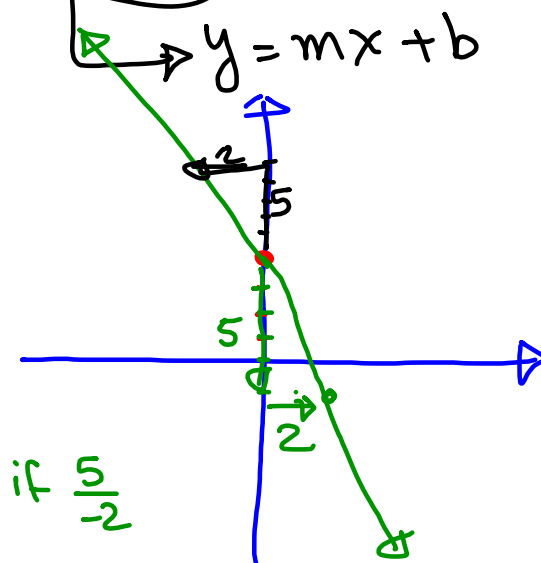
Convert to Slope-Int form, then graph

$$5x + 2y = 8$$

$$2y = -5x + 8$$

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

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



write $y - 1 = \frac{3}{5}(x + 4)$ in slope-int form,

then graph.

$$y - 1 = \frac{3}{5}x + \frac{3}{5} \cdot 4$$

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

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

$$5y = 3x + 17$$

$$\boxed{y = \frac{3}{5}x + \frac{17}{5}}$$

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

$$\boxed{y = \frac{3}{5}x + \frac{17}{5}}$$

Y-Int
(0, $\frac{17}{5}$)

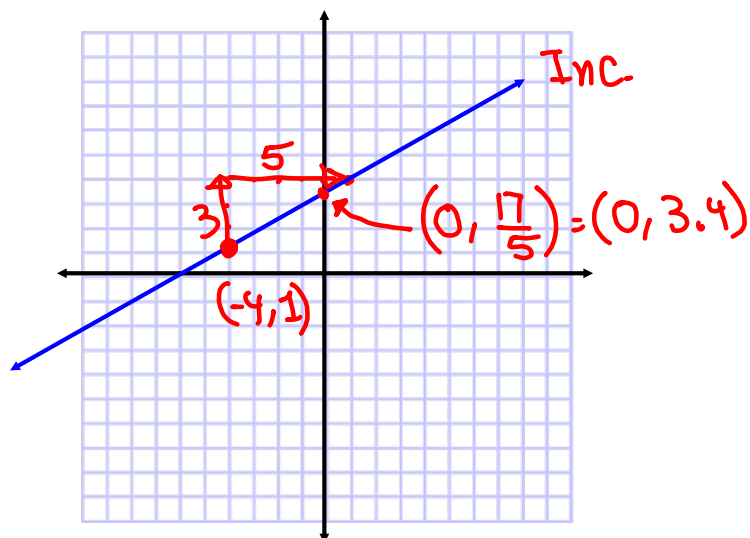
Another method

$$y - 1 = \frac{3}{5}(x + 4)$$

$$LCD = 5$$

$$5y - 5 = 3(x + 4)$$

$$5y - 5 = 3x + 12$$



How to find equation of a line that contains the point (x_1, y_1) with slope m .

Given: (x_1, y_1) & m .

1) Use Point-Slope Formula

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

2) Simplify, write final Answer

in slope-Int. form $y = mx + b$

Find eqn of a line that contains $(3, 5)$ with slope 2.

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

$$y - 5 = 2x - 6$$

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

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

Find eqn of a line that contains $(4, -2)$
with slope $-\frac{3}{4}$

Given: $(4, -2)$, $m = -\frac{3}{4}$

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

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

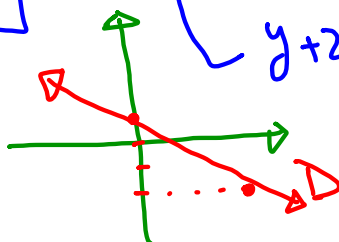
$$y - y_1 = m(x - x_1)$$

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

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

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

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



Find eqn of a line that contains $(0, -5)$ with
slope $\frac{3}{7}$.

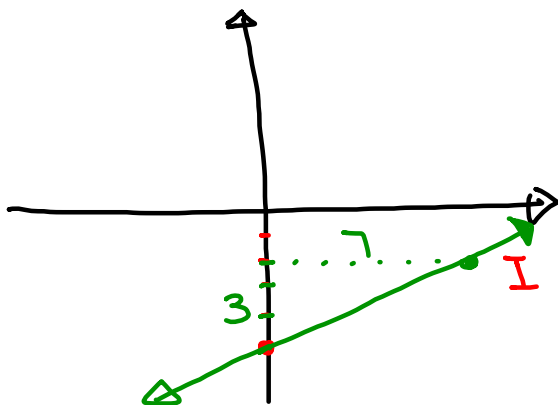
Given: $(0, -5)$, $m = \frac{3}{7}$

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

$$y - (-5) = \frac{3}{7}(x - 0)$$

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

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



Find eqn of a line with slope $-\frac{3}{2}$ and it contains $(5, -2)$.

we have slope & one point

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

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

$$y + 2 = -\frac{3}{2}x + \frac{15}{2}$$

$$\text{LCD} = 2$$

$$2y + 4 = -3x + 15$$

$$2y = -3x + 15 - 4$$

$$2y = -3x + 11$$

$$\boxed{y = -\frac{3}{2}x + \frac{11}{2}}$$

$$\frac{11}{2} = 5.5$$

How to find eqn of a line that contains (x_1, y_1) and (x_2, y_2) :

1) find slope $m = \frac{y_1 - y_2}{x_1 - x_2}$ $m = \frac{y_2 - y_1}{x_2 - x_1}$

2) use one of the point, and slope
then use $y - y_1 = m(x - x_1)$

3) Simplify, final Ans. in Slope-Int form.

Find eqn of a line that contains
 $(3, 5)$ and $(0, 1)$

$$m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{5 - 1}{3 - 0} = \frac{4}{3}$$

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

$$y - 1 = \frac{4}{3}(x - 0)$$

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

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

Find eqn of a line that contains
 $(4, 0)$ & $(0, -2)$

$$m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{0 - (-2)}{4 - 0} = \frac{2}{4} = \frac{1}{2}$$

$$y - y_1 = m(x - x_1) \quad \text{Point-Slope Formula}$$

$$y - -2 = \frac{1}{2}(x - 0)$$

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

Find eqn of a line that contains

$(2, -7)$ and $(2, 5)$

$$m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{-7 - 5}{2 - 2} = \frac{-12}{0} \text{ undefined}$$

No slope

V.L.

$$\boxed{x = 2}$$

Find eqn of a line that contains

$(3, -7)$ and $(0, -7)$

$$m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{-7 - (-7)}{3 - 0} = \frac{-7 + 7}{3} = \frac{0}{3} = 0$$

H.L.

Zero slope

$$y = -7$$

$$\boxed{y = -7}$$

Project 1: In Your Packet

Look For Points & Lines

Presentation
matters.

"3 Pages"

"50 Problems"

You
are
responsible

for your
own cover page

Use the graphing page
available on my website

4 Problems/ Page

one side only.
Due next Thursday.