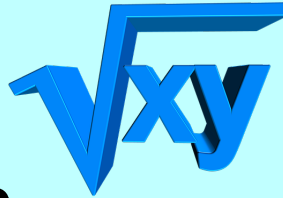# Math 115

Fall 2017

Lecture 10

$\sqrt{xy}$

Some Review

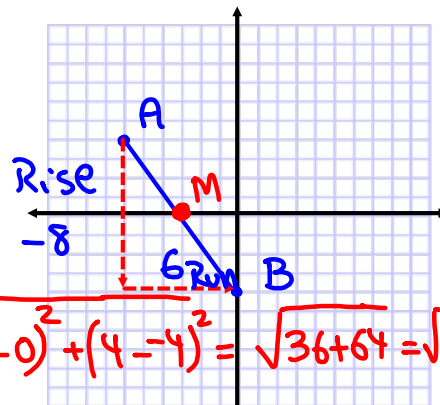$A(-6, 4)$, $B(0, -4)$

1) Draw $\overline{AB}$

2) find distance

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2} = \sqrt{(-6-0)^2 + (4--4)^2} = \sqrt{36+64} = \sqrt{100} = 10$$

3) find midpoint

$$M\left(\frac{-6+0}{2}, \frac{4 + -4}{2}\right) = M(-3, 0)$$

A

Rise

−8

6 Run   B

M

4) find Slope

$$m = \frac{-8}{6} = \frac{-4}{3}$$

$A(-3,-5)$ $B(1,3)$

1) Draw $\overline{AB}$ $d = \sqrt{(-3-1)^2 + (-5-3)^2} = \sqrt{(-4)^2 + (-8)^2}$

$= \sqrt{16 + 64}$

2) Find distance

$= \sqrt{80}$

≈ 9

3) find mid point

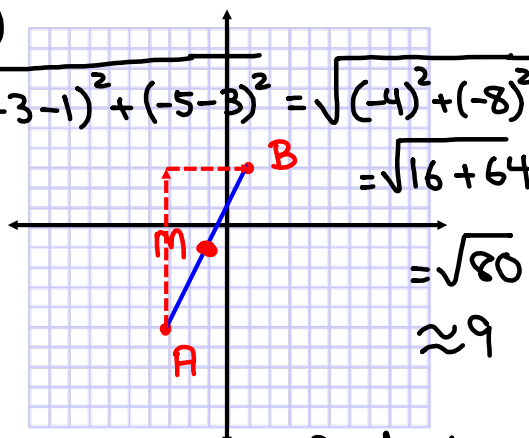$M\left(\dfrac{-3+1}{2}, \dfrac{-5+3}{2}\right) = M(-1,-1)$

4) find slope

$m = \dfrac{8}{4} = \boxed{2}$
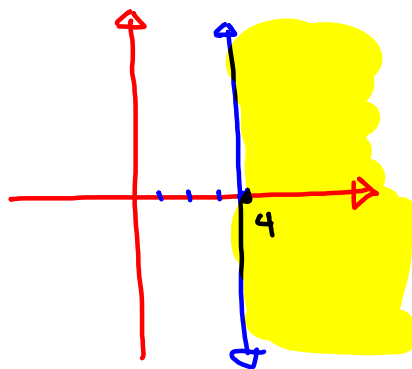
$m = \dfrac{y_1 - y_2}{x_1 - x_2} = \dfrac{-5-3}{-3-1}$

$(-3,-5) \xi (1,3)$ $2 = \dfrac{2\cancel{0}}{1\cancel{0}} \dfrac{Rise}{Run}$
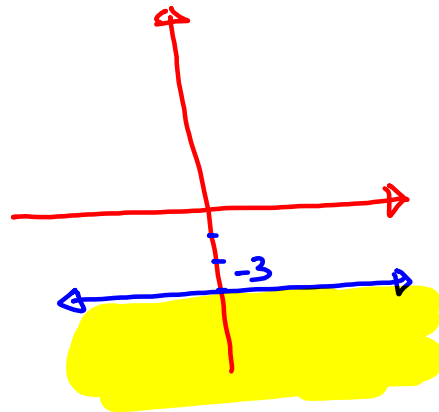
$= \dfrac{-8}{-4} = \boxed{2}$
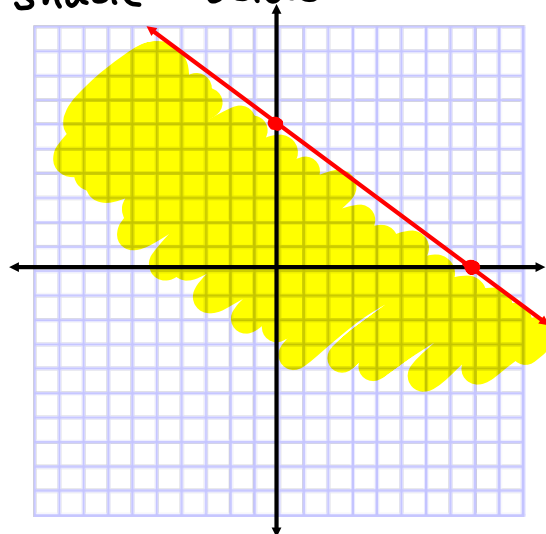

Graph $x = 4$, and shade to its right.

Vertical line

4

Graph $y = -3$, and shade below it

Horizontal line

Graph $3x + 4y = 24$ using the intercept method, then shade below it.

x	y
0	6
8	0

Graph $2x - 5y = 20$ using intercept method, then shade above it.

x	y
0	-4
10	0

$(10, 0)$

$(0, -4)$
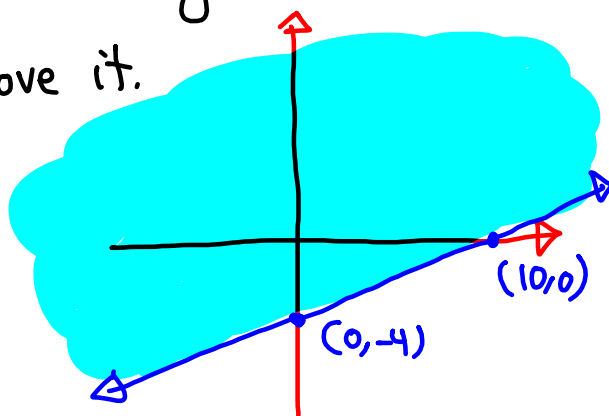
Draw $x = -3$, $y = 4$, and $2x - 3y = 12$. Shade the region that is bounded (enclosed) by all three.

x	y
0	-4
6	0

$x = -3$

$y = 4$

$2x - 3y = 12$
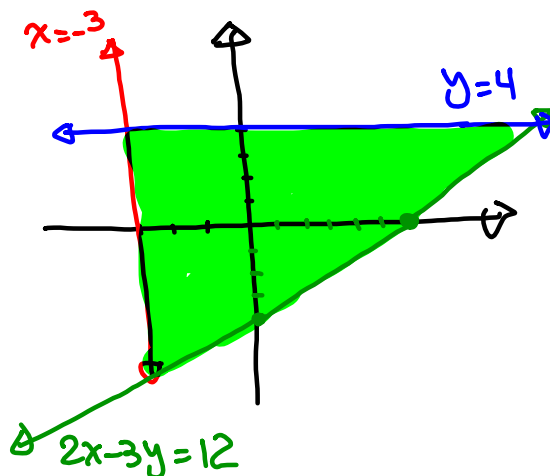
Slope - Int. form

$$y = mx + b$$

Y-Int $(0, b)$

Slope m

1) Plot $(0, b)$

2) from there, use rise & run of the slope to find another Point

3) Draw the line

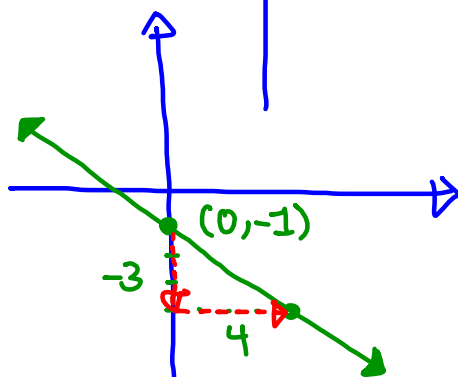$$y = \frac{2}{5}x + 4$$

Y-Int $(0, 4)$

Slope $m = \frac{2}{5}$ Rise Run

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

Y-Int $(0, -1)$

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

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

Slope   Y-Int (0,-2)   m   Y-Int (0,4)

Same Slope
Parallel lines

(0,4)

(0,-2)

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

Shade the region enclosed by all three lines.

$\boxed{\frac{-3}{4}} \cdot \boxed{\frac{4}{3}} = \frac{-12}{12} = \boxed{-1}$

lines are $\perp$.
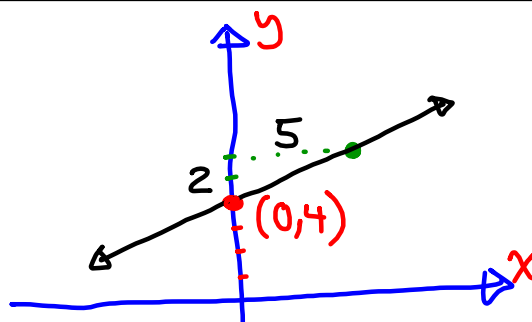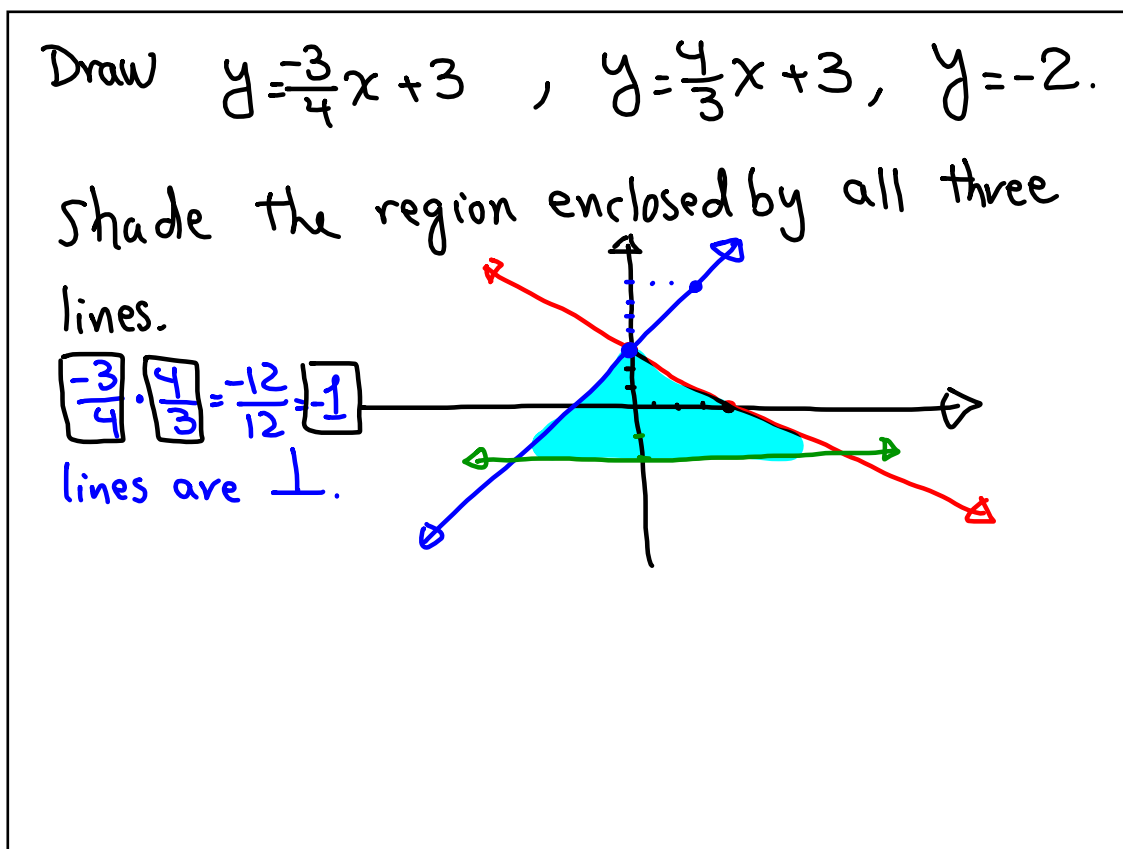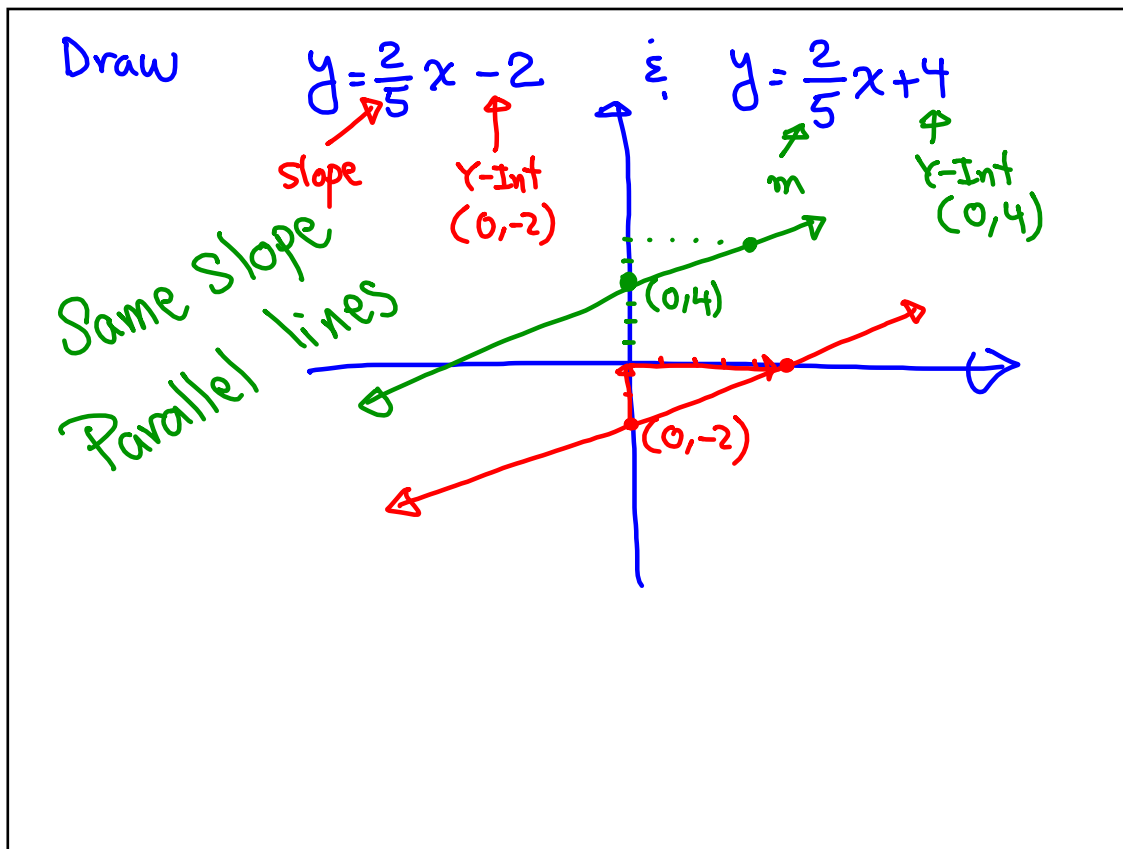
Graph

$(5x) + 3y = 6$

Isolate y

$3y = -5x + 6$

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

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

$m = \frac{-5}{3}$ $\frac{Rise}{Run}$

(0,2)

-5

3
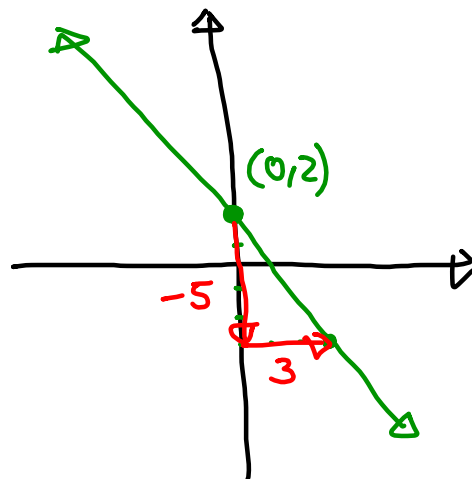
Graph

$(3x) - 4y = 8$

$-4y = -3x + 8$

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

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

Use slope formula to find slope of $\overleftrightarrow{AB}$
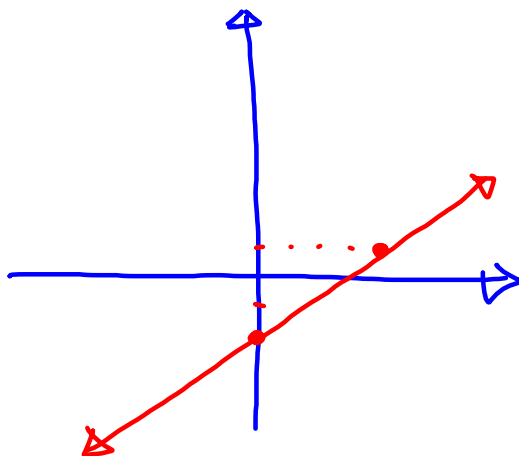where $A(5, -2)$ and

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

1) $B(5, 10)$ $(5, -2)$

$$m = \frac{10 - (-2)}{5 - 5}$$

$$= \frac{12}{0} \quad \text{Undefined}$$

No Slope

2) $B(0, -2)$ $(5, -2)$
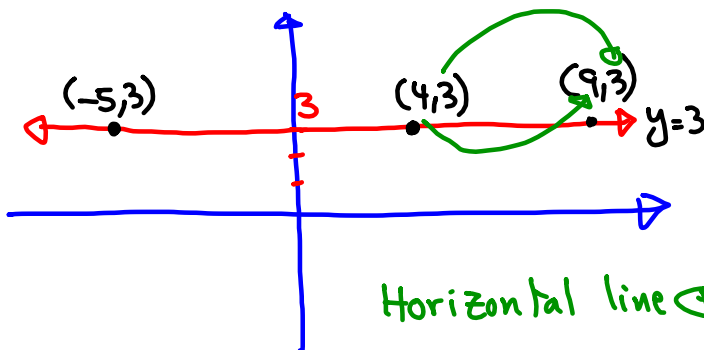
$$m = \frac{-2 - (-2)}{0 - 5}$$

$$= \frac{-2 + 2}{-5} = \frac{0}{-5}$$

$$= 0$$

Zero Slope

Find the slope of line below:
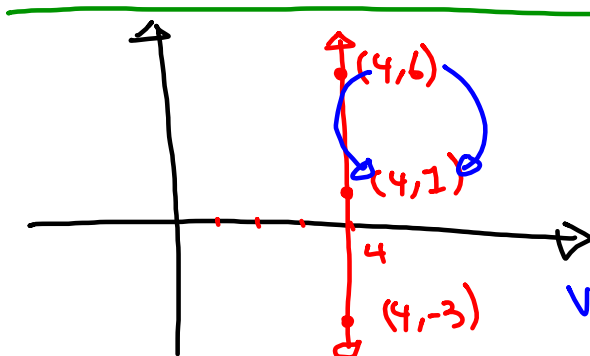
$(-5, 3)$ 3 $(4, 3)$ $(9, 3)$ $y = 3$

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

$$= \frac{0}{-5} = 0$$

Horizontal line ⟷ Zero slope

$(4, 6)$

$(4, 1)$

4

$(4, -3)$

$$m = \frac{6 - 1}{4 - 4} = \frac{5}{0}$$

Undefined

Vertical line ⟷ No Slope

8

Write $\dfrac{x}{5} - \dfrac{y}{2} = 1$ in Slope-Int. form

Use LCD = 10 to clear fraction

$y = mx + b$

Isolate y

$\overset{2}{\cancel{10}} \cdot \dfrac{x}{\cancel{5}} - \overset{5}{\cancel{10}} \cdot \dfrac{y}{\cancel{2}} = 10 \cdot 1$

$2x - 5y = 10$

$-5y = -2x + 10$

Divide by -5

$y = \dfrac{-2}{-5}x + \dfrac{10}{-5}$

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

$m = \dfrac{2}{5}$ Y-Int $(0, -2)$

Write $y + 4 = \dfrac{2}{3}(x - 3)$ in Slope-Int. form

$y = mx + b$

Hint: Distribute & Simplify

Isolate y

$y + 4 = \dfrac{2}{3}x - \dfrac{2}{\cancel{3}} \cdot \cancel{3}$

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

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

$\boxed{y = \dfrac{2}{3}x - 6}$ $m = \dfrac{2}{3}$ Y-Int $(0, -6)$

I have 7 Dimes, and 2 Quarters.

How much do I have?

$$7(10) + 2(25) = 70 + 50 = 120$$

$$\$1.20$$

Kid's tkt $4   A group of 12

Adult's tkt $10   kids and 5 adults.
                   find Total cost.

$$12(4) + 5(10) = 48 + 50 = 98 \qquad \$98$$

Lisa has $3.20

Dimes & Quarters only.

# of Dimes is 3 less than the # of

Quarters.   Dimes $\to x-3$

How many of each?   Quarters $\to x$

$$10 \cdot \text{Dime} + 25 \, \text{Quarter} = 320$$

$$\boxed{x = 10}$$

$$10(x-3) + 25x = 320$$

$$10x - 30 + 25x = 320$$

$$35x = 350$$

10 Quarters

7 Dimes

Leo raised $344 by selling tickets for ELAC Connect Dance.

Student's tkt: $7

Faculty's Tkt: $15

8 faculties & 32 Students

# of students attended this dance was 4 times # of faculties at the dance.

How many of each?

Student: $4x$

Faculty: x

$15 \cdot Faculty + 7 \, Student = 344$

$15x + 7 \cdot 4x = 344 \quad \boxed{x = 8}$

$43x = 344$

I got 73 and 81 on first two exams.

If my average is between 80 and 89, I can get a B final exam counts as 2 exams, find range of values that my final exam has to fall within to secure me a B grade.

$80 \leq$ Average ≤ 89

$80 \leq \dfrac{\text{Total}}{\text{\# of exams}} \leq 89$

$80 \leq \dfrac{73 + 81 + 2F}{4} \leq 89$

Multiply by 4 to clear fraction.

$80 \leq \dfrac{154 + 2F}{4} \leq 89$

$320 \leq 154 + 2F \leq 356$

$320 - 154 \leq 2F \leq 356 - 154$

$166 \leq 2F \leq 202$

$83 \leq F \leq 101$

Temp. in my hometown in the Summer is between 40°C to 50°C, inclusive.

Find the temp in F. $C = \dfrac{5}{9}(F - 32)$

$40 \leq C \leq 50$

$40 \leq \dfrac{5}{9}(F - 32) \leq 50$

$9 \cdot 40 \leq \cancel{9} \cdot \dfrac{5}{\cancel{9}}(F - 32) \leq 9 \cdot 50$

$360 \leq 5(F - 32) \leq 450$

Divide by and reduce

$$\frac{360}{5} \leq \frac{\cancel{5}(F-32)}{\cancel{5}} \leq \frac{450}{5}$$

$$72 \leq F - 32 \leq 90$$

Add 32 to all sides

$$72 + 32 \leq F - 32 + 32 \leq 90 + 32$$

$$\boxed{104° \leq F \leq 122°}$$

Inclusive

Every Friday

    9:30 - 11:30
        Special Tutor
            E7-210

Due tomorrow:
    SG 7 & SG 8