Math 115

Spring 2018

Lecture 8

$? \; a^2 + b^2 = c^2 \; ?$

$y = mx + b \quad ? \quad d = rt$

Solve, give Final Ans. in all 3 methods:

① $-6x + 15 < -3(x + 9)$

$-6x + 15 < -3x - 27$

$-6x + 3x < -27 - 15$

$-3x < -42$

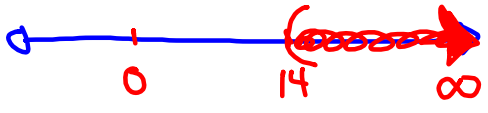
$\frac{-3}{-3}x > \frac{-42}{-3}$

$x > 14$

③ I.N. $(14, \infty)$

① S.B.N. $\{x \mid x > 14\}$

② Graph



② $-(x-4)+8 \geq 4(x+3)-10$

$-x+4+8 \geq 4x+12-10$

$-x+12 \geq 4x+2$

$-x-4x \geq 2-12$

$-5x \geq -10$

$\frac{-5}{-5}x \leq \frac{-10}{-5}$

$x \leq 2$

① S.B.N.

$\{x \mid x \leq 2\}$

② Graph

③ I.N.

$(-\infty, 2]$

③ $-6 < 3(x-2) \leq 12$

$-6 < 3x-6 \leq 12$

$-6+6 < 3x-6+6 \leq 12+6$

$0 < 3x \leq 18$

$\frac{0}{3} < \frac{3}{3}x \leq \frac{18}{3}$

$0 < x \leq 6$

① S.B.N.

$\{x \mid 0 < x \leq 6\}$

② Graph

③ I.N. $(0, 6]$

④ $-9 < 5 - 7x \leq 26$

Subtract 5 from LHS, Middle side, and RHS.

$-9-5 < 5-7x-5 \leq 26-5$

$-14 < -7x \leq 21$

Divide by -7

$\frac{-14}{-7} > \frac{-7x}{-7} \geq \frac{21}{-7}$

$2 > x \geq -3$

$-3 \leq x < 2$

① S.B.N. $\{x \mid -3 \leq x < 2\}$

② Graph

③ I.N. $[-3, 2)$

Solve $-3 < \frac{3}{4}(x-1) \leq 6$

① Clear fraction by using LCD=4

$4(-3) < 4 \cdot \frac{3}{4}(x-1) \leq 4 \cdot 6$

$-12 < 3(x-1) \leq 24$

② Distribute to remove ( ).

$-12 < 3x - 3 \leq 24$

③ Isolate the variable in the middle

Add 3, then divide by 3

$-12+3 < 3x \leq 24+3$

$-9 < 3x \leq 27$

$\frac{-9}{3} < \frac{3}{3}x \leq \frac{27}{3}$

$-3 < x \leq 9$

① S.B.N. $\{x \mid -3 < x \leq 9\}$

② Graph

③ I.N. $(-3, 9]$

Find two consecutive odd integers

Such that 4 times the Smaller one

reduced by twice the larger one is equal

to 50.

x & $x+2$

$4 \cdot \text{Smaller} - 2 \cdot \text{larger} = 50$

$4 \cdot x - 2 \cdot (x+2) = 50$

$4x - 2x - 4 = 50$

$2x = 54$

$x = 27$

27 & 29

Find three consecutive even integers

Such that the difference of

3 times the first one and the third one

is equal 44 more than the second one.

x , $x+2$, $x+4$

First Second Third

$3 \cdot x - (x+4) =$

$x+2+44$

$3x - (x+4) = x + 46$

$3x - x - 4 = x + 46$

$2x - 4 = x + 46$

$2x - x = 46 + 4$

$x = 50$

50, 52, and 54

Two angles are Complementary.

One of them is 10° more than the other one.

Find both angles.

A → x

B → x+10

Total = 90°

A + B = 90°

x + x+10 = 90

2x = 80

x = 40

40° & 50°

Two angles are Complementary.

One of them is 15° less than twice the other one.

Find both angles.

A → x

B → 2x−15

A + B = 90

x + 2x−15 = 90

3x = 105

x = 35

35° & 55°

Two angles are Supplementary

One of them is 30° more than the other one.

$A + B = 180$

Find the large angle.

$A \to x \to 75°$

$B \to x + 30 \to 105°$

$x + x + 30 = 180$

$2x = 150$

$x = 75$

the larger angle is 105°

Two angles are Supplementary.

4 times one of them reduced by the other one is equal to 145°.

Find both angles.

$A + B = 180$

$4 \cdot A - B = 145$

$A \to x$

$x + B = 180$

$B \to 180 - x$

$4(x) - (180 - x) = 145$

$4x - 180 + x = 145$

$5x = 145 + 180$

$5x = 325$

$x = 65$

65° & 115°

Two angles are Supplementary.

3 times one of them reduced by 5 times the other one is equal to $-340°$.

Find the larger angle.

$A + B = 180$

$3A - 5B = -340$

$A \to x \to 70°$

$x + B = 180$

$B \to 180 - x \to 110°$

$3x - 5(180 - x) = -340$

$3x - 900 + 5x = -340$

$8x = -340 + 900$

$8x = 560$

$x = 70$

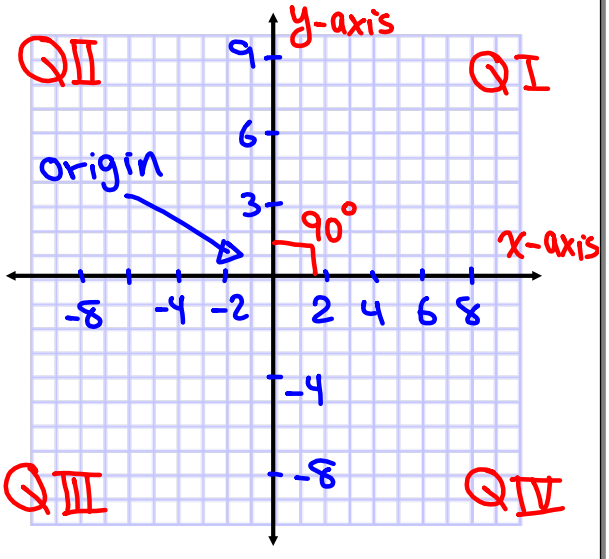
The larger angle is $110°$

SG 6 → Monday

Exam 1 → Monday

Ch. 3 Graphing Rectangular Coordinate System

Points → ordered-pair (x, y)



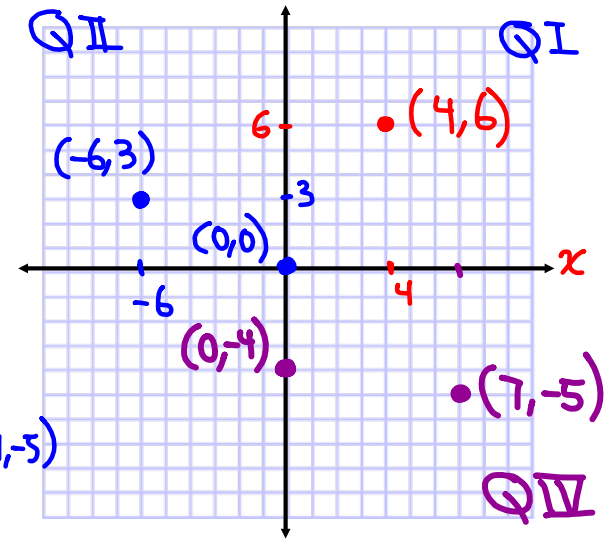
Plot (4,6)

x y

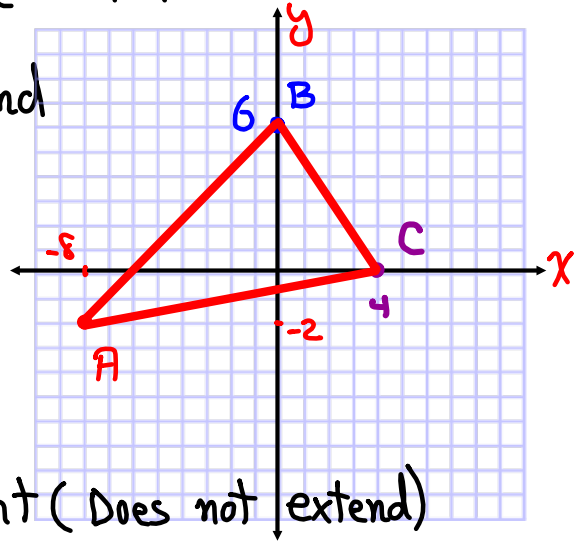
Plot (-6,3)

Plot (0,-4) & (7,-5)

x y



Draw triangle ABC with vertices A(-8,-2), B(0,6), and C(4,0)



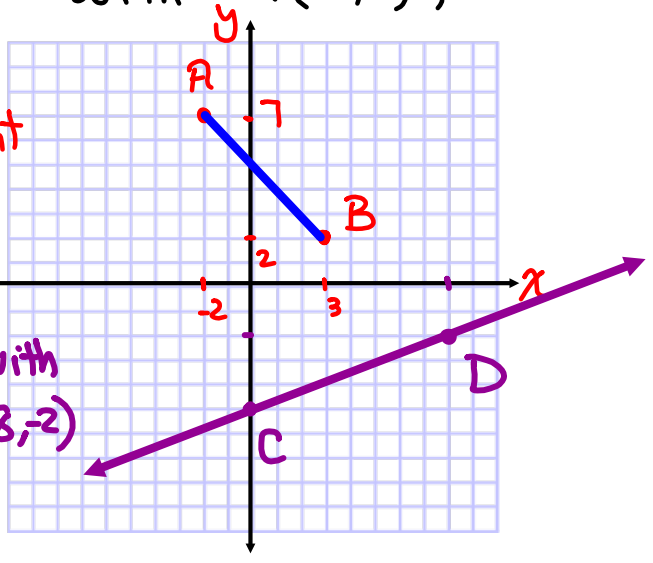
Lines

$\overline{AB}$ line Segment (Does not extend)

$\overleftrightarrow{AB}$ line

Draw $\overline{AB}$ with A(-2,7), and B(3,2)

Line Segment

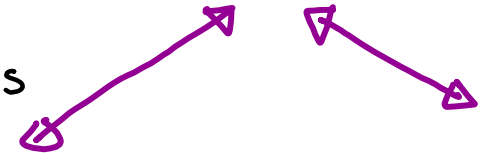


Draw $\overleftrightarrow{CD}$ with C(0,-3), D(8,-2)

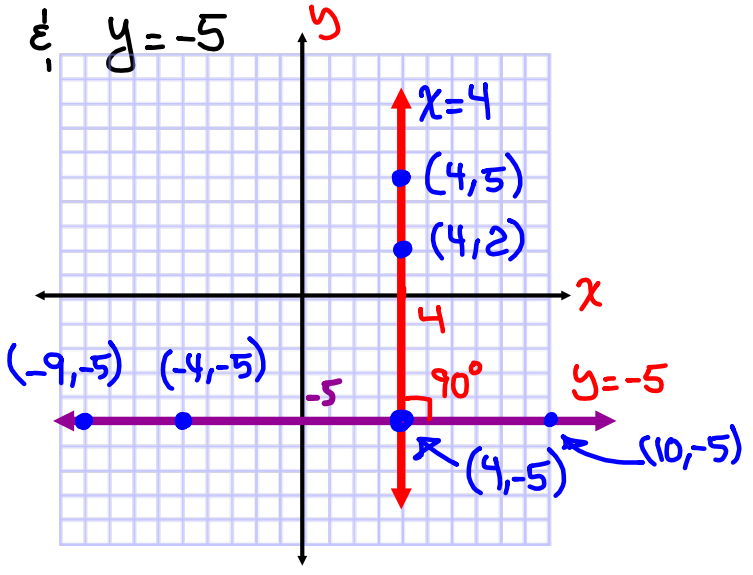
we can have

1) Vertical lines  $x = a$

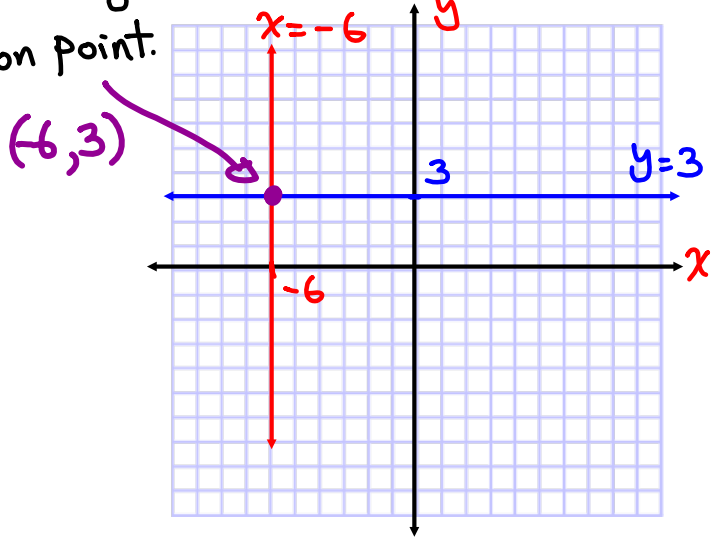
2) Horizontal lines  $y = b$

3) Slant lines 

Draw $x=4$ & $y=-5$



Graph $x=-6$ & $y=3$, clearly mark their intersection point.



Slant lines

Standard form	$Ax+By=C$	$2x-3y=9$
Slope - Int. form	$y=mx+b$	$y=\frac{3}{4}x-8$
Point - Slope form	$y-y_1=m(x-x_1)$	$y-2=3(x+1)$

Convert $2x-3y=9$ to Slope-Int form

"y has to be isolated"

Solve for y.

$-3y=-2x+9$

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

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

Write $4x+5y=20$ in Slope-Int. form.

$5y=-4x+20$

$y=\frac{-4}{5}x+\frac{20}{5}$

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

Write $\frac{2}{3}x-\frac{3}{5}y=0$ in Slope-Int. form.

Use LCD=15 to clear fractions.

Isolate Y, Solve for y

$\cancel{15}^{5}\cdot\frac{2}{\cancel{3}}x-\cancel{15}^{3}\cdot\frac{3}{\cancel{5}}y=15\cdot 0$

$10x-9y=0$

$-9y=-10x$

$y=\frac{-10x}{-9}$

$\boxed{y=\frac{10}{9}x}$

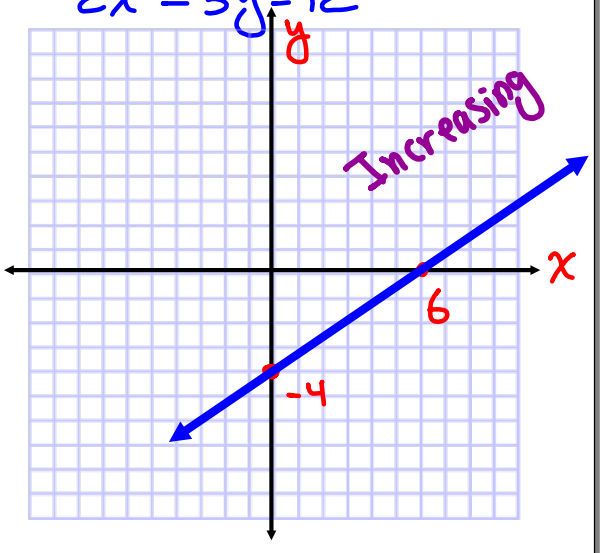
Graphing $Ax + By = C$ by intercept method

Use this method when C is divisible by both A and B.

$2x - 3y = 12$

x	y
0	?
?	0

x	y
0	-4
6	0



Graph $4x + 5y = -20$ by intercept Method.

x	y
0	-4
-5	0