Geometry R – Mr. Bo
Unit 12 – Day 1 Notes

Name: notes.
Date: _____

Graphing
Circles & Lines

Standard Form of a Circle: $(x-h)^2+(y-k)^2=r^2$

(h,k) is the Center **r** is the radius.

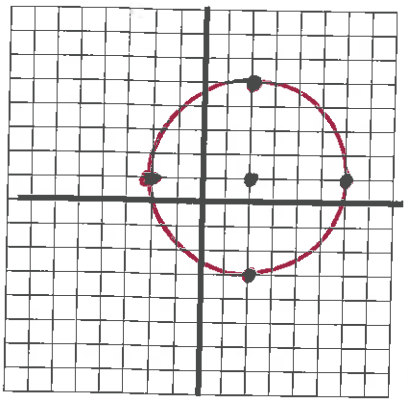
1 $(x-2)^2+(y-1)^2=16$

a. Find Center & Radius

Center is (2, 1)

radius is $\sqrt{16}$ or 4.

b. Graph (use a Compass!)



2. $(x+3)^2+y^2=12$

Find the center and radius.

Center is (-3, 0)

radius = $\sqrt{12}$

think of as: $(x-(-3))^2$

Double negative make a +.

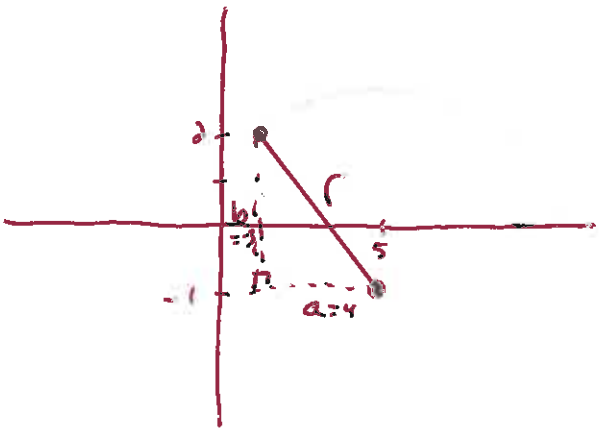
3. center = (6, -2) Radius = 5

Write the equation of the circle in standard form.

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

$(x-6)^2+(y+2)^2=25$

4. Find the standard form a circle centered at (5,-1) and passing through the point (1,2).



$a^2+b^2=r^2$

$(5-1)^2+(-1-2)^2=r^2$

$4^2+(-3)^2=r^2$

$16+9=r^2$

$r^2=25$

$r=5$

$(x-5)^2+(y+1)^2=25$

Completing the Square to find Standard Form:

Steps	$x^2+y^2+4x-2y-11=0$
a. Sort the equation - put x's together - put y's together - move constant to other side	$x^2+4x \quad +y^2-2y \quad =11$
b. Complete the Square - Add (1/2 x-term)^2 to both sides - Add (1/2 y-term)^2 to both sides	½ of 4 is 2. ½ of −2 is −1 $x^2+4x+(2)^2+y^2-2y+(-1)^2=11+(2)^2+(-1)^2$ $x^2+4x+4 \quad +y^2-2y+1=16$
c. Write in factored form - the (1/2 x-term) and (1/2 y-term) always end up inside the ( )'s.	$(x+2)(x+2)+(y-1)(y-1)=16$ $\boxed{(x+2)^2+(y-1)^2=16}$

5. Find the standard form of each circle. State the Center and Radius of each.

a. $x^2+y^2-8x+12y+43=0$

$x^2-8x \quad +y^2+12y \quad =-43$

$x^2-8x+(-4)^2+y^2+12y+(6)^2=-43+(-4)^2+(6)^2$

$(x-4)^2+(y+6)^2=9$

Center $=(4,-6)$

$r=3$

b. $x^2+y^2-14x+24=0$

b.) $x^2-14x \quad +y^2 \quad =-24$

$x^2-14x+(-7)^2+y^2+(0)^2=-24+(-7)^2+(0)^2$

$(x-7)^2+(y-0)^2=25$

$\boxed{(x-7)^2+y^2=25}$

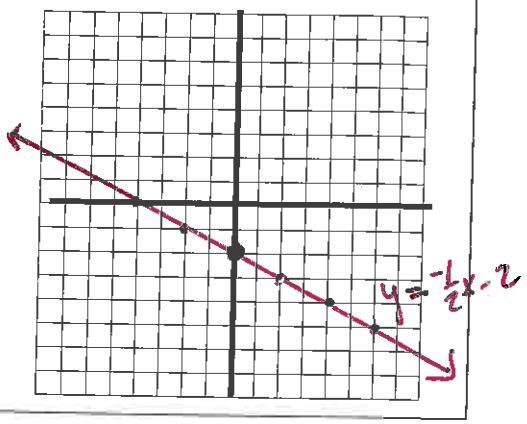
Center $=(7,0)$

$r=5$

Graphing a Line:

6. -4x – 8y = 16

Use a ruler!

a. Put in y=mx+b form	b. Find slope & intercept	3. Graph
$-4x-8y=16$ $-8y=4x+16$ $y=-\frac{1}{2}x-2$	Slope $=-\frac{1}{2}$ down / right y-int $=-2$	

Solving a system by graphing:

7. Solve by Graphing

$$25=(x+1)^2+y^2$$
$$y+x=-2$$

Circle

$25=(x+1)^2+y^2$

Center $(-1,0)$

$r=5$

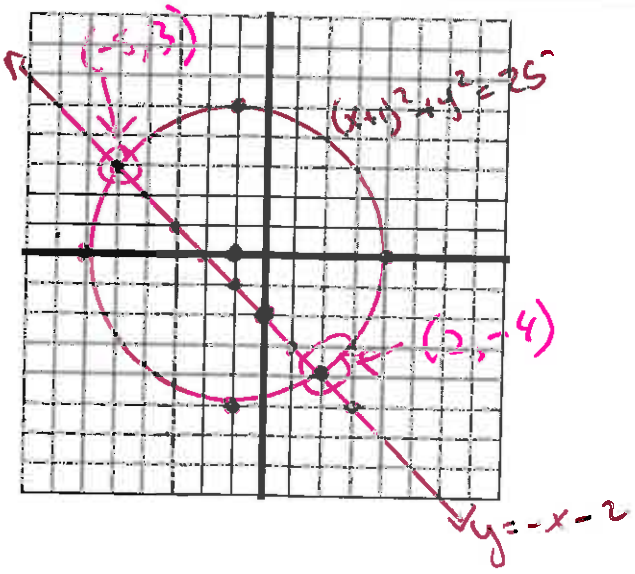
Line:

$y+x=-2$

$y=-x-2$

Slope $=\frac{-1}{1}$

$b=-2$.



Solutions:

(-5, 3) and (2, -4)