10/8 Notes

* they are opposites ex. $(x-3)^2+(y+2)^2=4$
center $(3,-2)$

Circle : has a center at (h,k) &
equation $(x-h)^2+(y-k)^2=r^2$ where r is the radius.

unit circle: center $(0,0)$ $r=1$ so $x^2+y^2=1$
→ parent function for ellipses.

ellipses

$\boxed{\text{Worksheet}}$

$\boxed{\text{HW 27}}$

$$\left(\frac{x-h}{b}\right)^2+\left(\frac{y-k}{a}\right)^2=1$$

H.D. # of squares L/R

V.D. # of squares U/D

always this

(h,k) center

Algebra 2 Name: KEY
4.7 Notes for Circles and Ellipses Period: ____

Reminder: A circle with center (h,k) and radius r has equation $(x-h)^2+(y-k)^2=r^2$

1. State the center and radius of each circle. Then graph the circle.

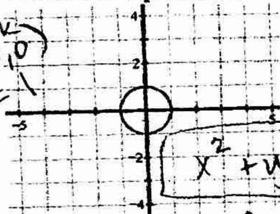
a. $x^2+y^2=9$ $\boxed{c(0,0) \quad r=3}$

b. $(x-1)^2+(y+2)^2=16$ $\boxed{c(1,-2) \quad r=4}$ $(1,-2)$

c. $(x+3)^2+(y-1)^2=4$ $\boxed{c(-3,1) \quad r=2}$

2. Write the equation of each circle.

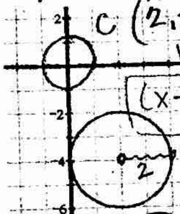
a. $c(0,0)$ $r=1$



$\boxed{x^2+y^2=1}$

$(x-0)^2+(y-0)^2=(1)^2$

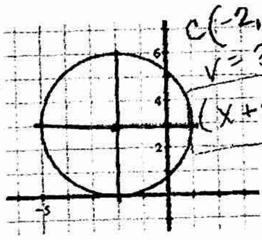
b. $c(2,-4)$ $r=2$



$\boxed{(x-2)^2+(y+4)^2=4}$ 2^2

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

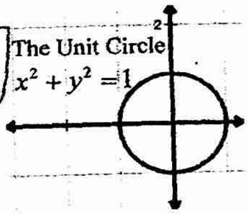
c. $c(-2,3)$ $r=3$



$\boxed{(x+2)^2+(y-3)^2=9}$

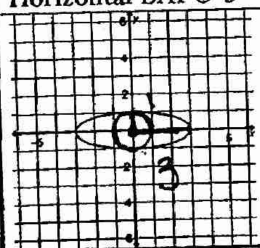
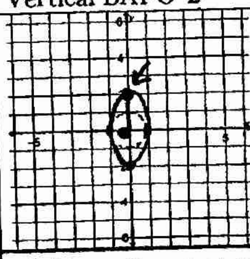
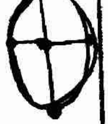
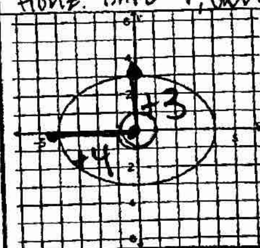
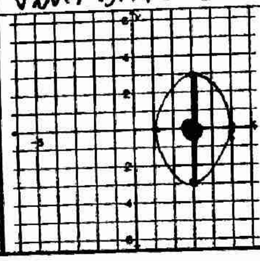
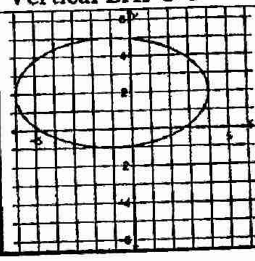
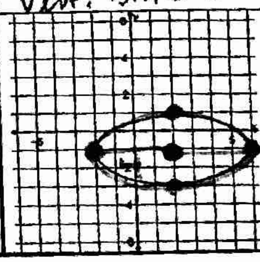
3. Find the equation of a circle with center $(5,-9)$ and radius 7 $\boxed{(x-5)^2+(y+9)^2=49}$

The Unit Circle
$x^2+y^2=1$



The Unit Circle is the parent equation for circles and ellipses.
We can make an ellipse by stretching the unit circle using vertical and horizontal dilations.

4. Use your knowledge of transformations to complete the table.

Equation	$\left(\frac{x}{3}\right)^2+\frac{y^2}{1}=1$ $\frac{1}{3}\cdot x \to \frac{x}{3}$	$\frac{x^2}{1}+\left(\frac{y}{2}\right)^2=1$ $\frac{1}{2}\cdot y \to \frac{y}{2}$	$\left(\frac{x}{4}\right)^2+\left(\frac{y}{3}\right)^2=1$
Center	(0,0)	(0,0)	(0,0)
Dilations	Horizontal BAFO 3	Vertical BAFO 2	Horiz. BAFO 4, Vert. BAFO 3
Graph	 3	 	 +3 +4
Equation	$\left(\frac{x-3}{2}\right)^2+\left(\frac{y}{3}\right)^2=1$	$\left(\frac{x+1}{5}\right)^2+\left(\frac{y-2}{3}\right)^2=1$	$\left(\frac{x-2}{4}\right)^2+\left(\frac{y+1}{2}\right)^2=1$
Center	(3,0)	(−1,2)	(2,−1) (2,−1)
Dilations	Horiz. BAFO 2 Vert. BAFO 3	Horizontal BAFO 5 Vertical BAFO 3	Horiz. BAFO 4 Vert. BAFO 2
Graph	 6		

$\left(\frac{x}{4}\right)^2+\left(\frac{y}{3}\right)^2$

center
L/R
U/D