

Circles MTH 112 Monday 10-8-12
CLASS NOTES

$$x^2 + y^2 = r^2$$

$$\boxed{(x-h)^2 + (y-k)^2 = r^2} \quad \checkmark$$

NOTE

$$\frac{(x-h)^2}{r^2} + \frac{(y-k)^2}{r^2} = 1$$

Ellipse Compare to ellipse —



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

Biggest
(vertices)

(co-vertices)

or



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

Biggest

$$c^2 = a^2 - b^2$$

↑
Foci

a

$$(17) \quad (x+2)^2 + (y-3)^2 = 16$$

$$\boxed{C(-2, 3) \quad r = 4}$$

$$(23) \quad x^2 + y^2 + 4x + 6y - 3 = 0$$

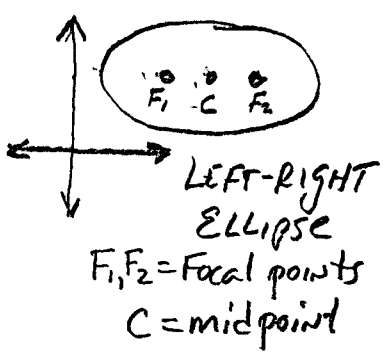
$$(x^2 + 4x + \{2^2\}) + (y^2 + 6y + \{3^2\}) = 3 + \{13\}$$

$\downarrow \qquad \downarrow \qquad \downarrow \qquad \downarrow$

$$(x+2)^2 + (y+3)^2 = 16$$

$$\boxed{C(-2, -3) \quad r = 4}$$

Summary of the Equations of an Ellipse



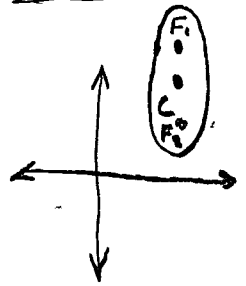
$$\frac{(x-h)^2}{a^2} + \frac{(y-k)^2}{b^2} = 1$$

↑
 Larger denominator
 $a > b$

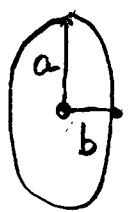
$C(h, k)$
 $F_{1,2}(h \pm c, k)$



$$c^2 = a^2 - b^2$$



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



↑
 Larger denominator
 $a > b$

$C(h, k)$
 $F_{1,2}(h, k \pm c)$

$$c^2 = a^2 - b^2$$

29. $(X+6)^2 + \frac{y^2}{49} = 1$



$$\frac{(X+6)^2}{b^2} + \frac{(y-0)^2}{a^2} = 1$$

$M(-6, 0)$ center

$$c^2 = a^2 - b^2$$

$$c^2 = 49 - 1$$

$$c = \sqrt{48} = 4\sqrt{3}$$

$F_1(-6, 4\sqrt{3})$
 $F_2(-6, -4\sqrt{3})$ Foci

Vertices $(-6, \pm 7)$

Co-Vertices $(-6+1, 0) = (-5, 0)$
 $(-6-1, 0) = (-7, 0)$ Co-vertices