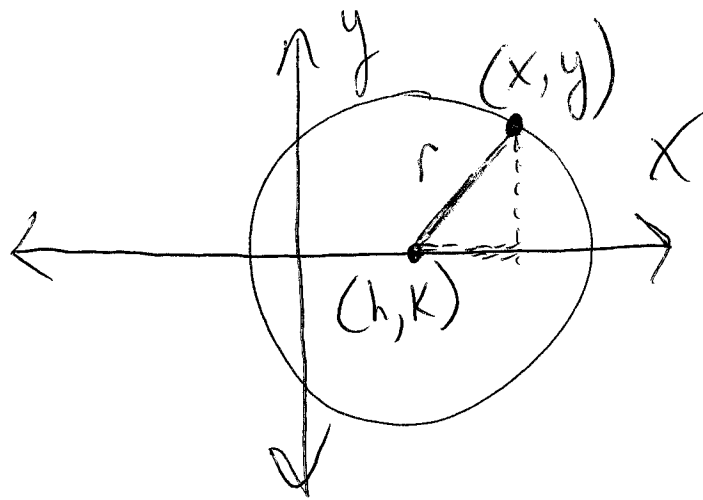A circle is the set of all points equidistant from a given point, called the center. The center is always denoted by the coordinats (h, K).

Any segment whose endpoints are the Center and a point on the circle is called a radius, "r."

We can figure out the equation of a circle using the Distance Formula!
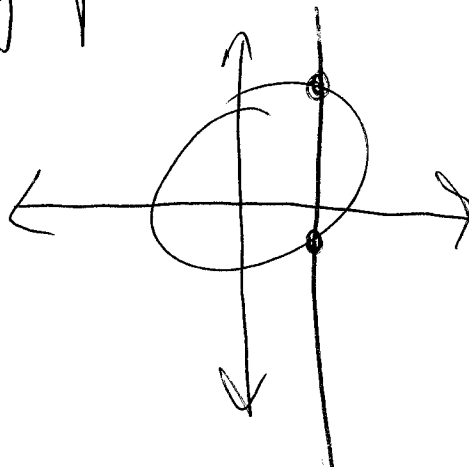
$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = d$$

$$\sqrt{(x_2-x_1)^2 + (y_2-y_1)^2} = d$$

$$\left(\sqrt{(x-h)^2 + (y-k)^2}\right)^2 = (r)^2$$

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

↗ this is the equation of
a circle, with center (h,k)
and radius r.

Is the graph of a circle a function?

$$(x-h)^2 + (y-k)^2 = r^2$$

Ex1 Write the equation of a circle centered at (0,0) with radius of 4 ~~cm.~~ units.

$$(x-0)^2 + (y-0)^2 = 16$$
$$x^2 + y^2 = 16$$

Ex2 Center $\overset{h,k}{(-12,0)}$ $r = \sqrt{23}$

$$(x--12)^2 + (y-0)^2 = \left(\sqrt{23}\right)^2$$
$$(x+12)^2 + y^2 = 23$$

Ex3 Center $\overset{h\quad k}{(8,-9.5)}$ $r = \frac{1}{2}$ units

$$(x-8)^2 + (y+9.5)^2 = \frac{1}{4}$$
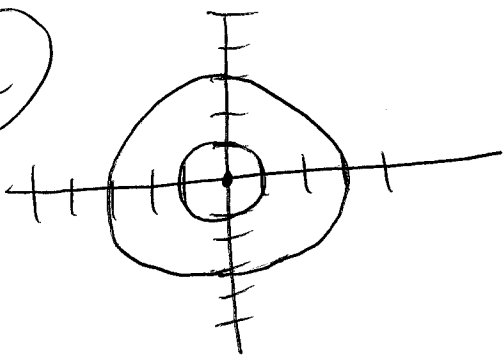
p. 426 (#1) Compare $(x+3)^2 (y-4)^2 = 16$
$$(x-3)^2 (y-2)^2 = 16$$

* Both have radius of 4 units
Centers are $(-3, 4)$ & $(3, 2)$

(#2)

$$x^2 + y^2 = 1$$

$$x^2 + y^2 = 9$$

(#9.) $(x-4)^2 + (y-1)^2 = 9$ $(4, 1)$ $r = 3$

(#10) $x^2 + (y-14)^2 = 34$ $(0, 14)$ $r = \sqrt{34}$

(#11) $(x-4)^2 + y^2 = \dfrac{16}{25}$ $(4, 0)$ $r = \dfrac{4}{5}$

P. 427   # 17 - 28
        # 41 - 43