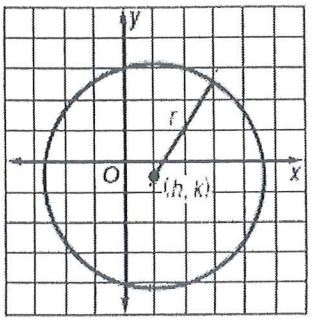
Geometry

Date: *Key*

10-8 Notes, Equations of Circles

- A circle is defined as the locus of points (set of points) in a plane equidistant (same distance) from a given point.
  center
- The standard equation for a circle with center at (h, k) and a radius of r units is:



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

(x,y) → set of points that form the circle

Example 1: Write an equation for a circle with center $(-1, 3)$ and radius 6.

(h,k) r

$$(x-(-1))^2+(y-3)^2=6^2$$

$$\boxed{(x+1)^2+(y-3)^2=36}$$

Example 2: Write an equation for a circle whose diameter has endpoints at $(2, 2)$ and $(-2, 2)$.

need center (h,k) and radius r

center: $(0,2)$

radius: 2

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

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

Example 3: Identify the center and the diameter of the circle $x^2+(y+5)^2=64$.

radius: 8 $(x-0)^2+(y-(-5))^2=8^2$

Center: $(0,-5)$ Diameter: 16

Example 4: Graph $(x+3)^2+(y-1)^2=9$.

$$(x-(-3))^2+(y-1)^2=3^2$$

① center: $(-3,1)$

② radius: 3