Circles
10.3
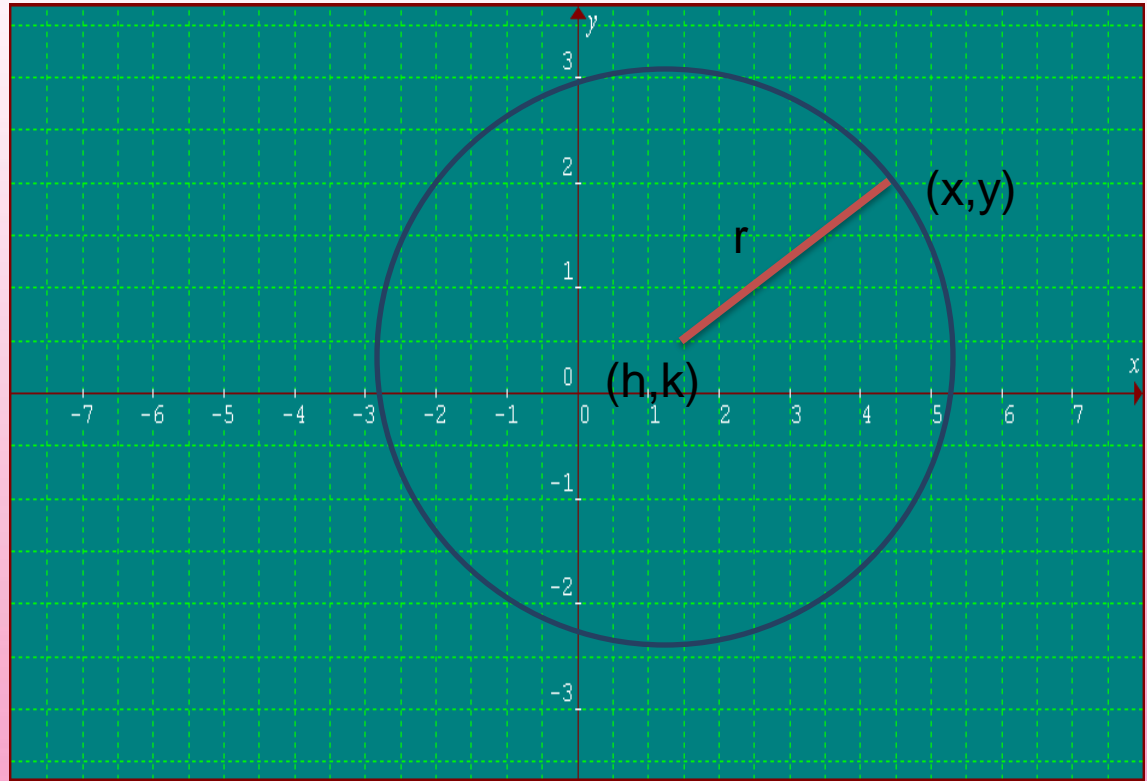
Equations of circles

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

Equation of circle with center (h,k)

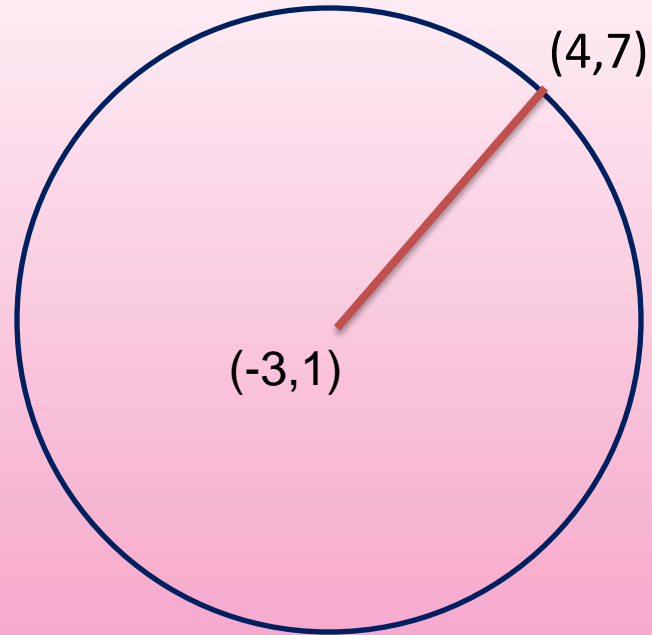# Write an equation from the graph

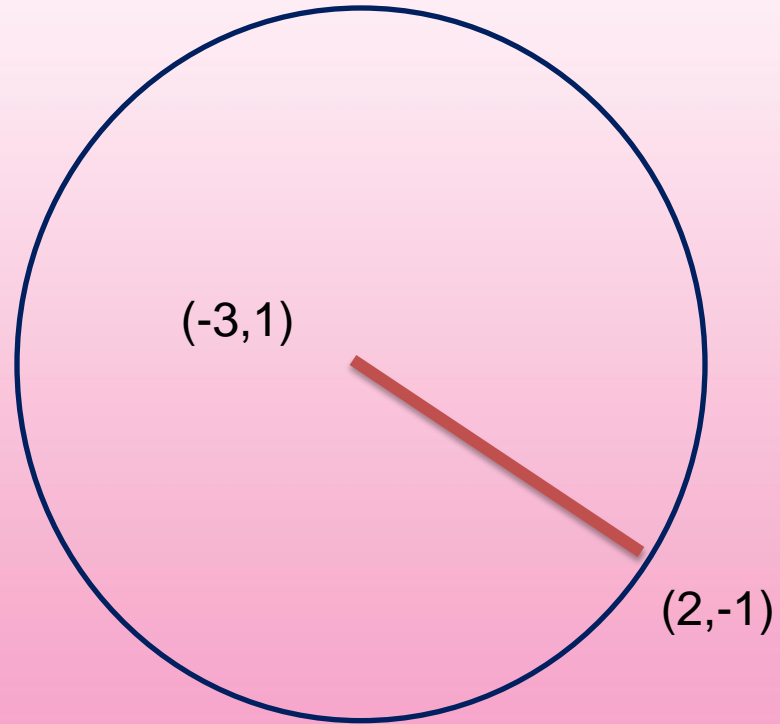$$h = -3, k = 1, x = 4, y = 7$$

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

$$(4-(-3))^2 + (7-1)^2 = r^2$$

$$85 = r^2$$

$$(x+3)^2 + (y-1)^2 = 85$$

(4,7)

(-3,1)

Your turn

Write an equation for each circle given the radius and the center

Center (4,9), r = 6

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

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

$(x-4)^2 + (y-9)^2 = 36$

h= 4 , k = 9

Your turn

Center (1,0) , r = $\sqrt{15}$

Write an equation for each circle given the endpoints of a diameter

(-4 , -10) and (4, -10)

diameter = d = $\sqrt{(4+4)^2 + (-10+10)^2}$

d = 8 → r = 4

Center = $(\dfrac{-4+4}{2}, \dfrac{-10-10}{2})$

Center = (0,-10) = (h,k)

The equation is

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

$(x-0)^2 + (y-(-10))^2 = 4^2$

$x^2 + (y+10)^2 = 16$

Your turn

(5,-7) and (-2 , -9)

Thanks