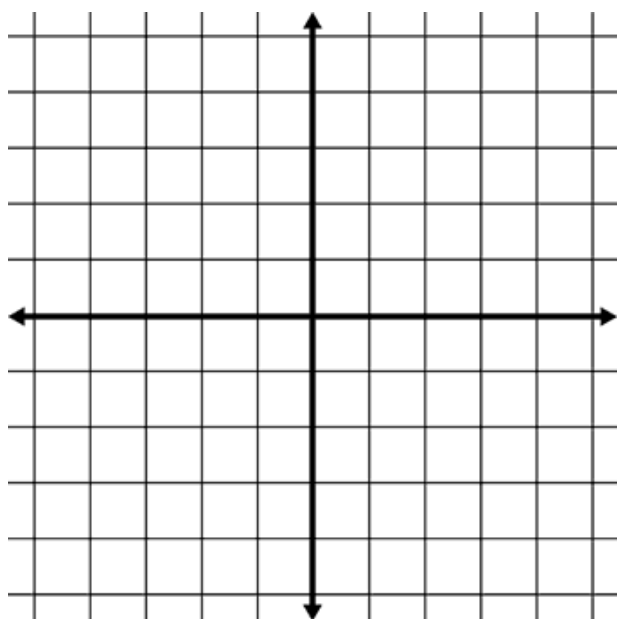


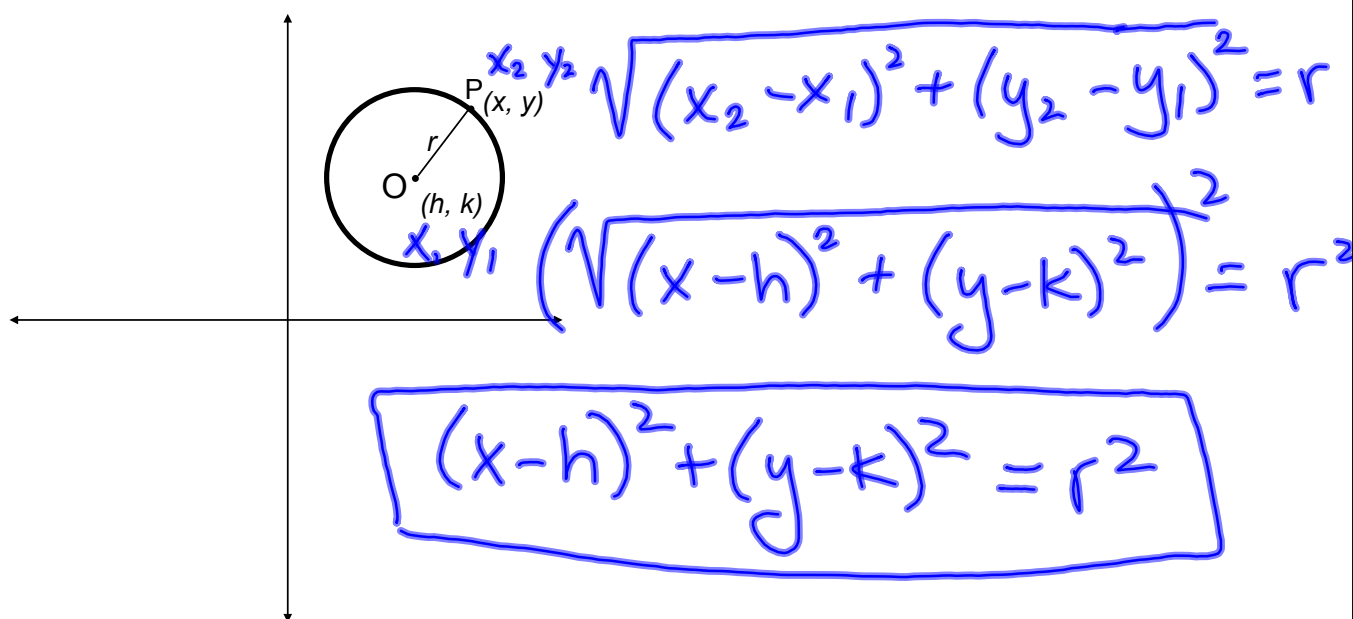
Do-now: What information is needed to describe a circle on a coordinate plane?



center

radius

What is the length of OP (the radius)?



## General Equation of a Circle

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

where  $(h, k)$  are the coordinates of the center of the circle

and  $r$  is the length of the radius of the circle

What is the equation of a circle with a center of  $(-4, 3)$  and a radius of 5?

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

$$(x - -4)^2 + (y - 3)^2 = 5^2$$

$$(x + 4)^2 + (y - 3)^2 = 25$$

The equation of a circle is  $(x - 5)^2 + (y + 2)^2 = 49$ .  
What are the coordinates of the center of the circle,  
and what is the length of the radius?

$$\text{Center} = (5, -2)$$

$$\text{radius} = 7$$

$$\sqrt{r^2} = \sqrt{49}$$
$$r = 7$$

The coordinates of the center of a circle are  $(\overset{h}{-1}, \overset{k}{0})$ .  
 A point on the circle is  $(3, -1)$ .  
 What is the equation of the circle?

$$\begin{aligned}
 (x-h)^2 + (y-k)^2 &= r^2 \\
 (3-(-1))^2 + (-1-0)^2 &= r^2 \\
 (4)^2 + (-1)^2 &= r^2 \\
 16 + 1 &= r^2 \\
 17 &= r^2 \\
 \sqrt{17} &= r
 \end{aligned}$$

$$\begin{aligned}
 (x-(-1))^2 + (y-0)^2 &= 17 \\
 (x+1)^2 + y^2 &= 17
 \end{aligned}$$

