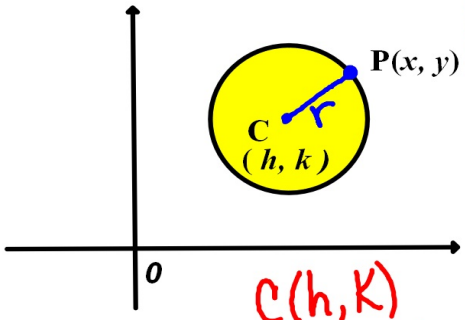
10.3 Equation of a Circle

A circle is the set of all points in a plane at a fixed distance (radius) from a given point (center).



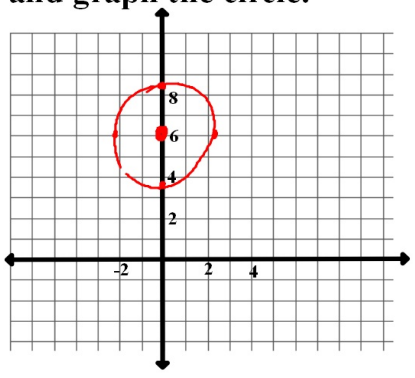
$\left(\sqrt{(x-h)^2+(y-k)^2}\right)^2=(r)^2$

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

C(h, K)
radius = r

Equation of Circle in Standard Form

Ex. 1 Find the center and radius of the circle $4x^2 + 4(y - 6)^2 = 20$ and graph the circle.



$\frac{4}{4}(x-0)^2+(y-6)^2=\frac{20}{4}$

$(x-0)^2+(y-6)^2=5^2$

C (0, 6)

$r=\sqrt{5}\approx 2.2$

Ex. 2 Write the equation of a circle with center (-2, -3) that passes through (0, 2).

h K

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

$(0+2)^2+(2+3)^2=r^2=29$

x y

$(x+2)^2+(y+3)^2=29$

Ex. 3 **Write $x^2 + y^2 - 14x + 10y - 2 = 0$ in standard form. Find center and radius.**

$(x^2 - 14x + 49) + (y^2 + 10y + 25) = 2 + 74$

$(x-7)^2 + (y+5)^2 = 76$

$C(7, -5)$ $r = \sqrt{76}$

$4 \cdot 19$

$r = 2\sqrt{19}$