In general

$\boxed{r = a\cos\theta}$

Circle center $\left(\frac{a}{2}, 0\right)$

Radius: $\frac{|a|}{2}$

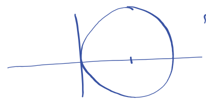
$\boxed{r = a\sin\theta}$

Circle center $\left(\frac{a}{2}, \frac{\pi}{2}\right)$

Radius: $\frac{|a|}{2}$

$r = 10\cos\theta$ Center: $(5, 0)$

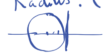
Radius: 5



$r = -6\cos\theta$

Center: $(-3, 0)$

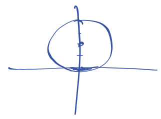
Radius: (3)



$r = 4\sin\theta$

Center: $\left(2, \frac{\pi}{2}\right)$

Radius:



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Why does the equation $r = a\cos\theta$ correspond to a circle centered at $\left(\frac{a}{2}, 0\right)$ and radius $\frac{|a|}{2}$?

$r = 4\cos\theta$

$r^2 = 4r\cos\theta$

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

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

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

$x = r\cos\theta$

$y = r\sin\theta$

$r^2 = x^2 + y^2$

$\tan\theta = \frac{y}{x}$

Center: $(2, 0)$

Radius: 2

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$r = a\cos\theta$

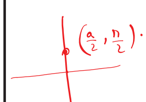
$r^2 = ar\cos\theta$

$x^2 + y^2 = ax$

$x^2 - ax + \left(\frac{a}{2}\right)^2 + y^2 = 0 + \left(\frac{a}{2}\right)^2$

$x^2 - ax + \frac{a^2}{4} + y^2 = \frac{a^2}{4}$

$\boxed{\left(x - \frac{a}{2}\right)^2 + y^2 = \frac{a^2}{4}}$



Center: $\left(\frac{a}{2}, 0\right)$

Radius: $\frac{|a|}{2}$

$r = a\sin\theta$; $r^2 = a\boxed{r\sin\theta}$; $x^2 + y^2 = ay$

$x^2 + y^2 - ay = 0$. $x^2 + y^2 - ay + \left(\frac{a}{2}\right)^2 = \left(\frac{a}{2}\right)^2$

Center: $\left(0, \frac{a}{2}\right)$ Radius: $\frac{|a|}{2}$ $\boxed{x^2 + \left(y - \frac{a}{2}\right)^2 = \frac{a^2}{4}}$

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$r = a + b\cos\theta$

$r^2 = ar + br\cos\theta$

$x^2 + y^2 = a\sqrt{x^2 + y^2} + bx$

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