Polar Coordinate System

1. Graph polar coordinates

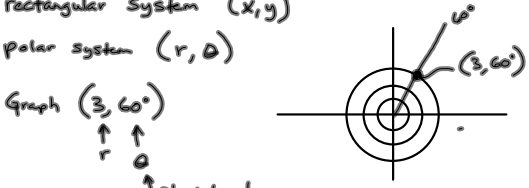
rectangular System (x, y)

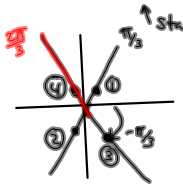
polar system (r, θ)

Graph $(3, 60°)$

r θ

Start here!





① $(1, \frac{\pi}{3})$ ③ $(1, -\frac{\pi}{3})$

② $(-1, \frac{\pi}{3})$ ④ $(-1, -\frac{\pi}{3}) =$

$(1, \frac{2\pi}{3})$

Note: Polar coordinates are NOT unique!

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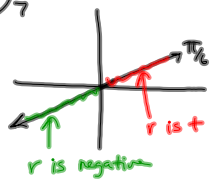
2. Graph polar equations

1. $r = 7$ ∞ $x = 7$ y can be anything

2. $\theta = \frac{\pi}{6}$



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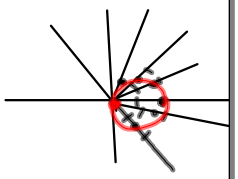
3. Graph $r = 2\cos\theta$

θ	$\cos\theta$	$r = 2\cos\theta$	(r, θ)
0	1	2	$(2, 0)$
$\frac{\pi}{6}$	$\frac{\sqrt{3}}{2}$	$\sqrt{3}$	$(\sqrt{3}, \frac{\pi}{6})$
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\sqrt{2}$	$(\sqrt{2}, \frac{\pi}{4})$
$\frac{\pi}{3}$	$\frac{1}{2}$	1	$(1, \frac{\pi}{3})$
$\frac{\pi}{2}$	0	0	$(0, \frac{\pi}{2})$
$\frac{3\pi}{4}$	$-\frac{\sqrt{2}}{2}$	$-\sqrt{2}$	$(-\sqrt{2}, \frac{3\pi}{4})$
$\frac{3\pi}{2}$	0	0	$(0, \frac{3\pi}{2})$
$\frac{11\pi}{6}$	$\frac{\sqrt{3}}{2}$	$\sqrt{3}$	$(\sqrt{3}, \frac{11\pi}{6})$

polar equation

∞ $y = f(x) = x + 1$

$r = f(\theta) = 2\cos\theta$



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