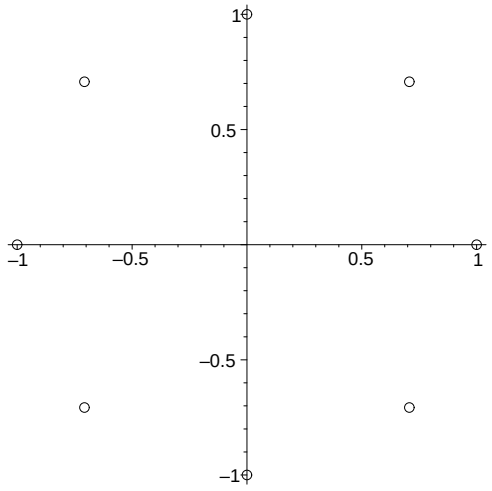
Math 103.01 Summer 2001
May 23, 2001

Example: Determine the graph of the curve $x = \cos t$, $y = \sin t$ for $0 \leq t \leq 2\pi$.

We begin by plotting a few points.

t	(x, y)
0	$(1, 0)$
$\pi/4$	$(1/\sqrt{2}, 1/\sqrt{2})$
$\pi/2$	$(0, 1)$
$3\pi/4$	$(-1/\sqrt{2}, 1/\sqrt{2})$
π	$(-1, 0)$
$5\pi/4$	$(-1/\sqrt{2}, -1/\sqrt{2})$
$3\pi/2$	$(0, -1)$
$7\pi/4$	$(1/\sqrt{2}, -1/\sqrt{2})$
2π	$(1, 0)$

Plotting these points suggest that (x, y) lie in a circle.



Note that $x^2 + y^2 = \cos^t + \sin^2 t = 1$ for all t.

Therefore, $x = \cos t$, $y = \sin t$, for $0 \leq t \leq 2\pi$ describes the unit circle in $\mathbb{R}^2$.