Pre-Calculus Notes Name: Key

Section 10.8 - Graphs of Polar Equations

To graph $r = 4\sin\theta$ on the graphing calculator:

MODE: Degree, Polar

WINDOW: $\theta\min = 0^\circ$, $\theta\max = 360^\circ$, $\theta\text{step} = 15^\circ$

Try $x\ [-4, 4]$ and $y\ [-4, 4]$.

Enter $r = 4\sin\theta$. It seems to be an ellipse (oval-shaped), but it isn't.

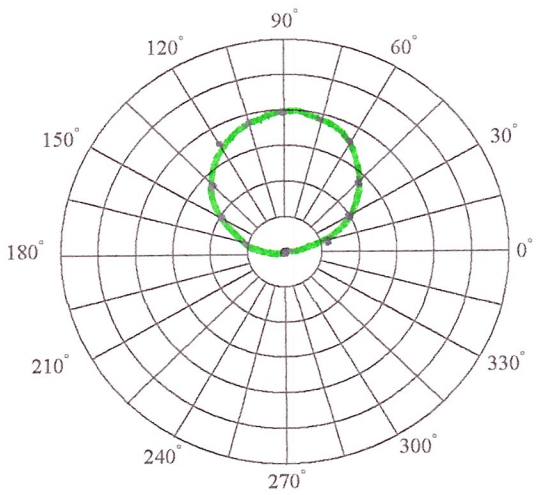
It is a circle. Use ZOOM 5! ← squares up the window

How do we find the coordinates for the graph so we can transfer to our polar graph? There are 2 options.

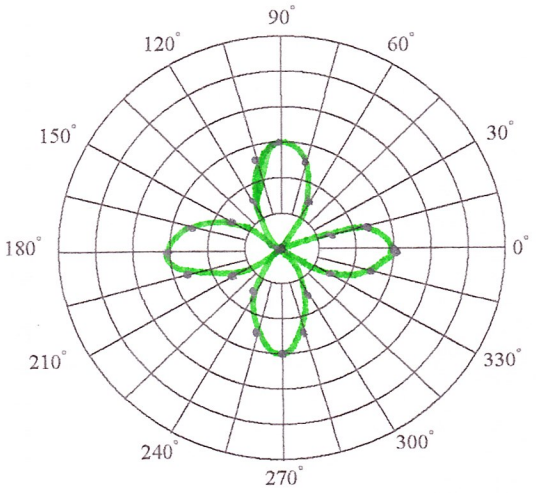
OPTION 1:	OPTION 2:
2ND FORMAT - PolarGC 2ND CALC - value Enter your desired value for θ and your calculator will give you the corresponding value for r.	2ND TBLSET TblStart = 0 ΔTbl = 15 2ND TABLE Scroll up and down to get your desired coordinates.

Now, graph.

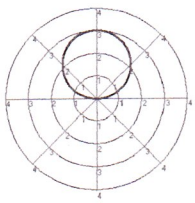
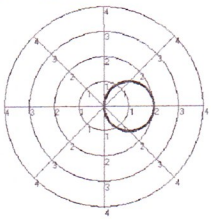
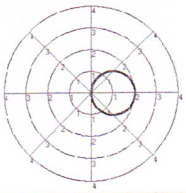
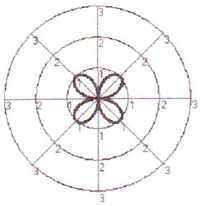
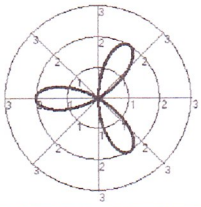
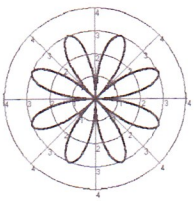
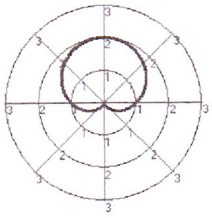
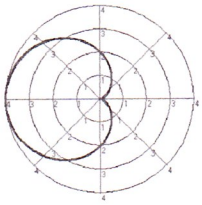
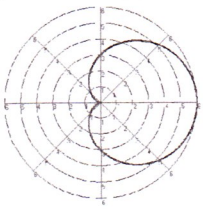
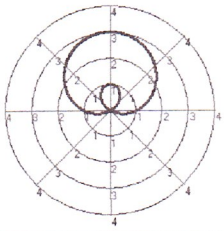
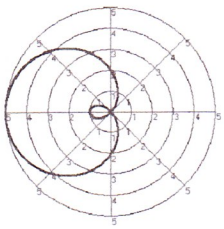
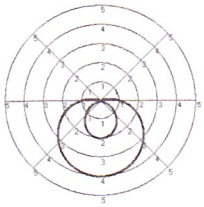
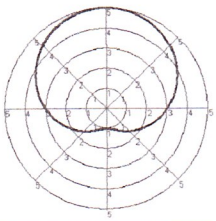
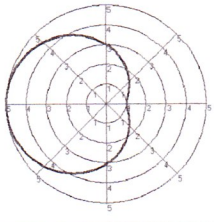
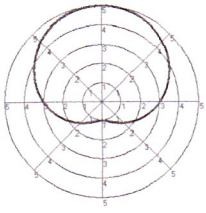
$r = 4\sin\theta$



$r = 3\cos 2\theta$



MEMORIZE!

Graphs	Name of Shape	Equation Type
$r = 3\sin\theta$  $r = 2\cos\theta$  $r = -\frac{1}{2}\sin\theta$ 	Circle	$r = a\cos\theta$ or $r = a\sin\theta$
$r = \sin 2\theta$  $r = -2\cos 3\theta$  $r = 4\sin 4\theta$ 	rose	$r = a\cos n\theta$ or $r = a\sin n\theta$ n odd → n petals n even → 2n petals
$r = 1+\sin\theta$  $r = 2-2\cos\theta$  $r = 3+3\cos\theta$ 	Cardiod	$r = a \pm b\cos\theta$ or $r = a \pm b\sin\theta$ * $\left\|\frac{a}{b}\right\| = 1$
$r = 1+2\sin\theta$  $r = 2-3\cos\theta$  $r = 1-3\sin\theta$ 	limaçon w/ loop	$r = a \pm b\cos\theta$ or $r = a \pm b\sin\theta$ * $\left\|\frac{a}{b}\right\| < 1$
$r = -3+2\sin\theta$  $r = -3-2\cos\theta$  $r = 3+2\sin\theta$ 	limaçon w/o loop	$r = a \pm b\cos\theta$ or $r = a \pm b\sin\theta$ * $\left\|\frac{a}{b}\right\| > 1$