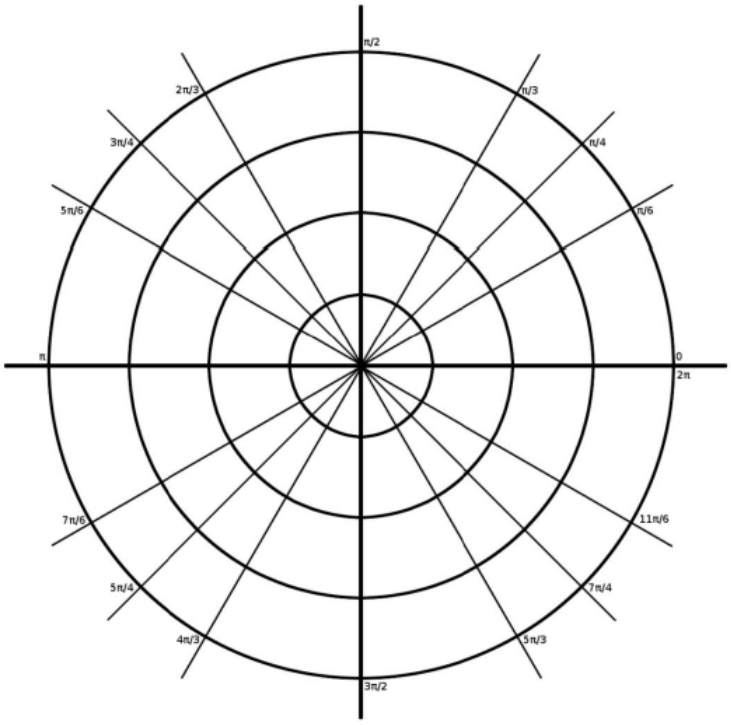
Example 1: A. Graph the polar equation $r = 2\cos\vartheta$

B. Find the zeros and the maximum value of r for the graph of $r = 2\cos\vartheta$..



ϑ	r
0	2
$\pi/6$	$\sqrt{3}$
$\pi/3$	1
$\pi/2$	0
$\frac{2\pi}{3}$	-1
$5\pi/6$	$-\sqrt{3}$
π	-2
$7\pi/6$	$-\sqrt{3}$
$3\pi/2$	0
$11\pi/6$	$\sqrt{3}$
2π	2

Example 2: Find the zeros and the maximum value of r for the graph $r = -3\sin\vartheta$.

Tests for Symmetry in Polar Coordinates

S.W.R.T.	Test	Example
The Line $\theta = \pi/2$	**Replace _____ with _____ then use the sum/difference formulas.**	
The Polar Axis	**Replace _____ with _____ then use the even/odd identities.**	
The Pole	**Replace _____ with _____ then simplify.**	

Sum and Difference Formulas:

$\sin(u \pm v) = \sin u \cos v \pm \cos u \sin v$

$\cos(u \pm v) = \cos u \cos v \mp \sin u \sin v$

Even/Odd Identities: Sine, cosecant, tangent and cotangent are odd functions. Cosine and secant are even functions.

$\sin(-\theta) = -\sin(\theta)$ $\quad \cos(-\theta) = \cos(\theta)$ $\quad \tan(-\theta) = -\tan(\theta)$

$\csc(-\theta) = -\csc(\theta)$ $\quad \sec(-\theta) = \sec(\theta)$ $\quad \cot(-\theta) = -\cot(\theta)$

Example 3: Test the following polar equations for ***each*** type of symmetry.

a. $r = 2\cos\vartheta$

b. $r = \dfrac{3}{2+\sin\vartheta}$

c. $r^2 = 25\sin 2\vartheta$

Look over the different types of graphs one can get using polar coordinates on page 787

Homework: Page 789 #7-22 all