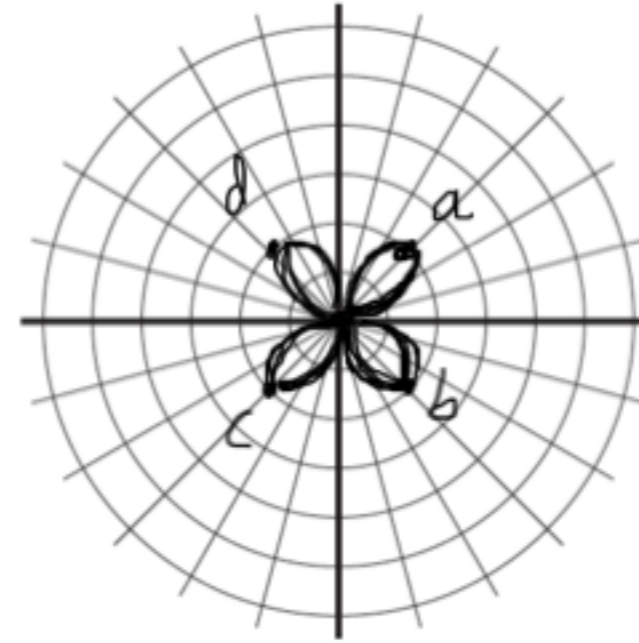
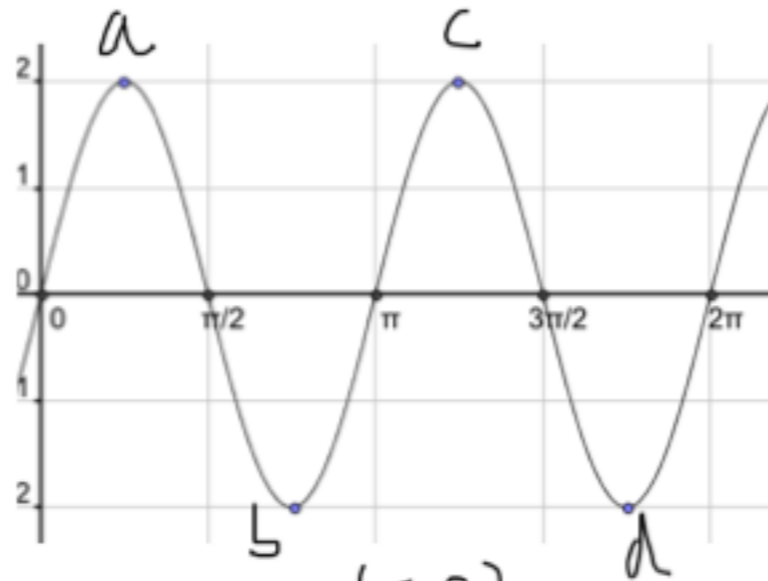


When you sketch a polar graph by hand, you need a lot of points. One way to gather these points is by using the wave graphs you are familiar with.

Let's say you want to graph $r = 2\sin 2\theta$. First graph the equation $y = 2\sin 2\theta$, as shown below.

(r, θ)

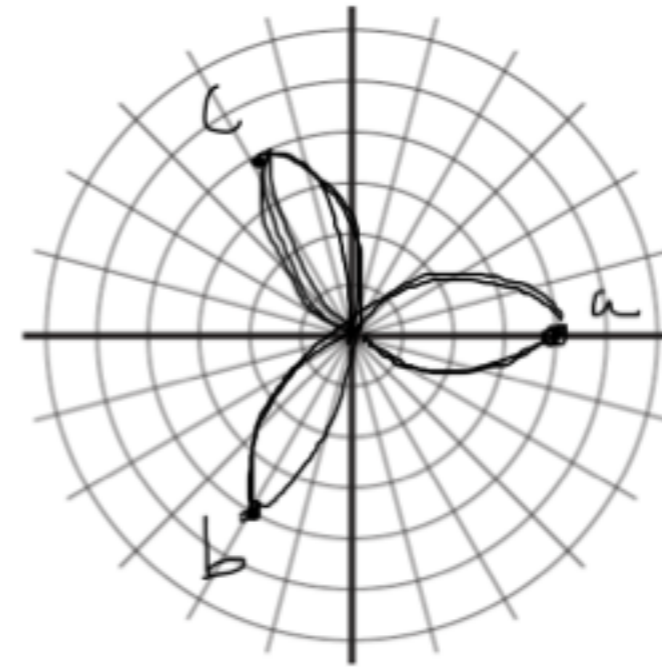
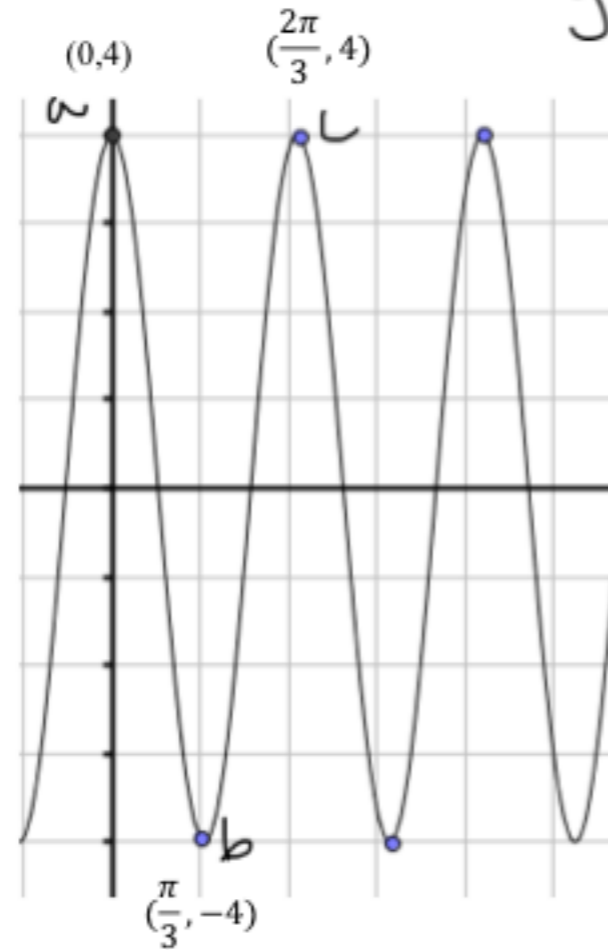


θ	$r = 2\sin 2\theta$
0	0
$\frac{\pi}{4}$	2
$\frac{\pi}{2}$	0
$\frac{3\pi}{4}$	-2
π	0
$\frac{5\pi}{4}$	2
$\frac{3\pi}{2}$	0
$\frac{7\pi}{4}$	-2
2π	

(r, θ)
 $(0, 0)$
 $(2, \pi/4)$
 $(0, \pi/2)$
 $(-2, 3\pi/4)$
 $(0, \pi)$
 $(2, 5\pi/4)$
 $(0, 3\pi/2)$
 $(-2, 7\pi/4)$

Graph $r = 4\cos 3\theta$. Make sure to move counterclockwise around the circle as you plot your polar points.

$$y = 4\cos 3\theta \quad P = \frac{2\pi}{3}$$



X	$r = 4\cos 3\theta$
0	4
$\frac{\pi}{6}$	0
$\frac{\pi}{3}$	-4
$\frac{\pi}{2}$	0
$\frac{2\pi}{3}$	4
$\frac{5\pi}{6}$	0
π	-4

(r, θ)

$(4, 0)$

$(0, \pi/6)$

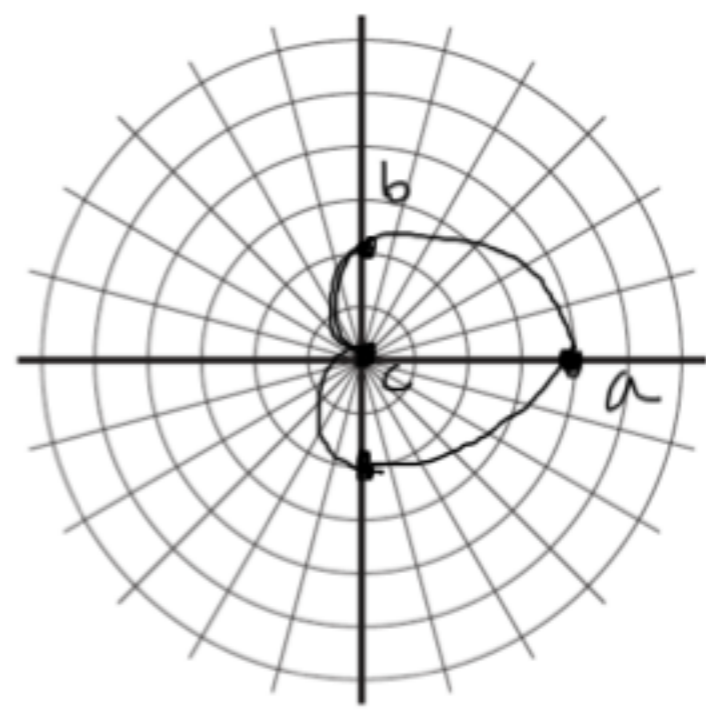
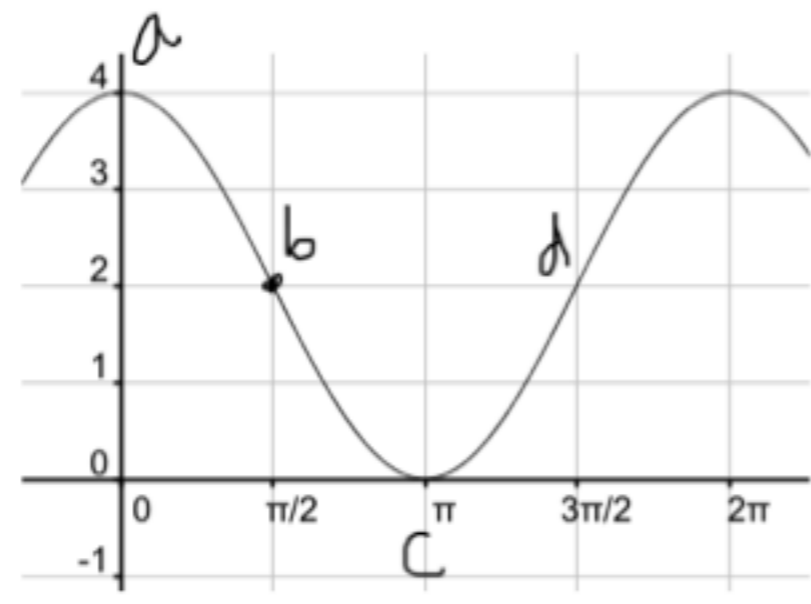
$(-4, \pi/3)$

$(0, \pi/2)$

$(4, 2\pi/3)$

$(-4, \pi)$

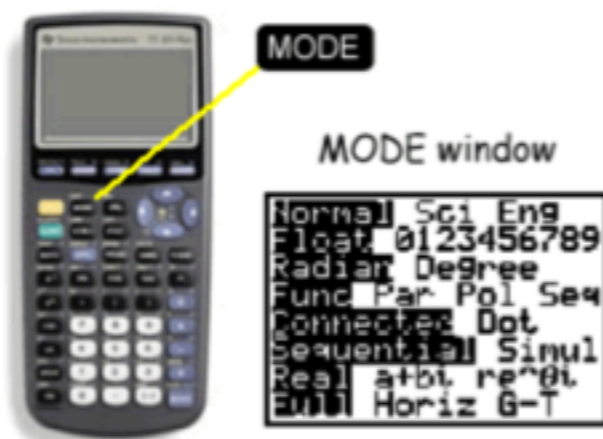
Graph $r = 2 + 2\cos\theta$. $y = 2 + 2\cos\theta$



(r, θ)

θ	$r = 2 + 2\cos\theta$	(r, θ)
0	4	$(4, 0)$
$\frac{\pi}{4}$		
$\frac{\pi}{2}$	2	$(2, \frac{\pi}{2})$
$\frac{3\pi}{4}$		
π	0	$(0, \pi)$
$\frac{5\pi}{4}$		
$\frac{3\pi}{2}$	2	$(2, \frac{3\pi}{2})$
$\frac{7\pi}{4}$		
2π	4	$(4, 2\pi)$

Now graph these on your graphing calculator. Go to MODE and select POL. Now go to y= and enter your polar equation. Go to WINDOW and make sure your x values go from 0 to 2π .



After selecting Pol graphing mode, press Y= to display the polar Y= editor.

