

Precalculus, Section 9.2, #50
 Polar Equations and Graphs

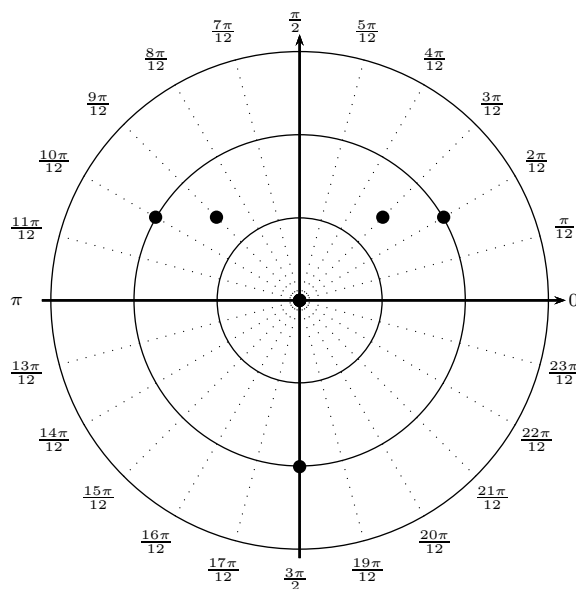
Identify and graph the polar equation. Verify your graph using a graphing utility.¹

$$r = 2 \sin(3\theta)$$

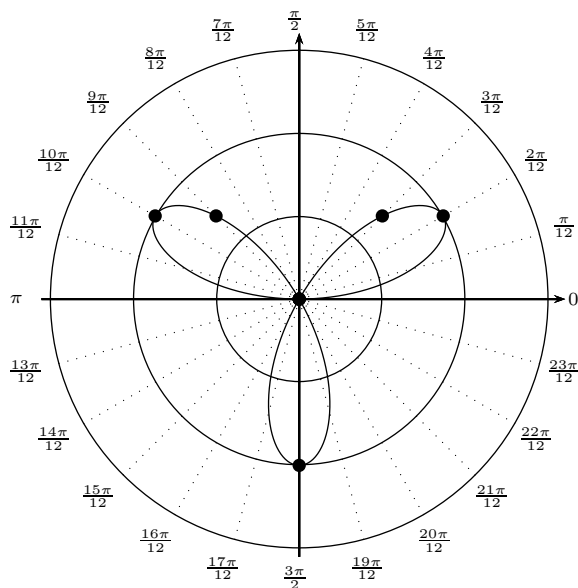
The given equation has the form $r = a \sin(3\theta)$ with $a > 0$, so the graph should be a rose with three petals. Let's make a table of values.

θ	r
0	0
$\frac{\pi}{6}$	2
$\frac{\pi}{4}$	$\sqrt{2}$
$\frac{\pi}{3}$	0
$\frac{\pi}{2}$	-2
$\frac{2\pi}{3}$	0
$\frac{3\pi}{4}$	$\sqrt{2}$
$\frac{5\pi}{6}$	2
π	0

These points are graphed on the grid at right. Using the graphing utility will help to clarify the graph of the function.



Using the TI-84 or other graphing utility, we get the graph



¹Sullivan, *Precalculus: Enhanced with Graphing Utilities*, p. 583, #50.