

6.2 Graphing Basic Polar Equations

3. Answer:

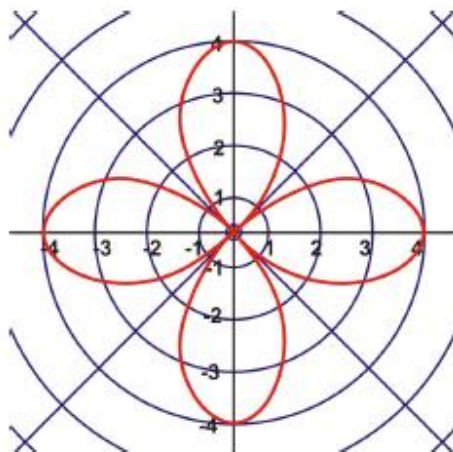


TABLE 6.1:

θ	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°	360°
$4 \cos 2\theta$	4	2	-2	-4	-2	2	4	2	-2	-4	-2	2	4

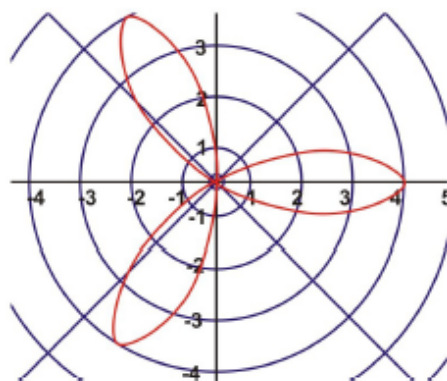


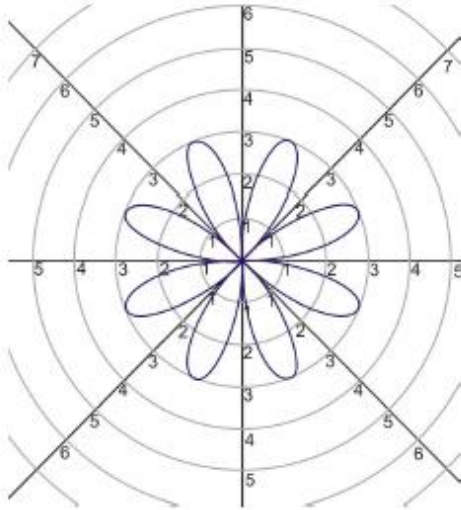
TABLE 6.2:

θ	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°	360°
$4 \cos 3\theta$	4	0	-4	0	4	0	-4	0	4	0	-4	0	4

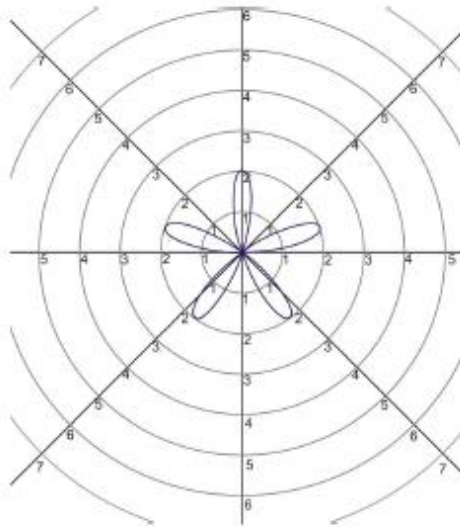
In the graph of $r = 4 \cos 2\theta$, the rose has four petals on it but the graph of $r = 4 \cos 3\theta$ has only three petals. It appears, that if n is an even positive integer, the rose will have an even number of petals and if n is an odd positive integer, the rose will have an odd number of petals.

4. Answers:

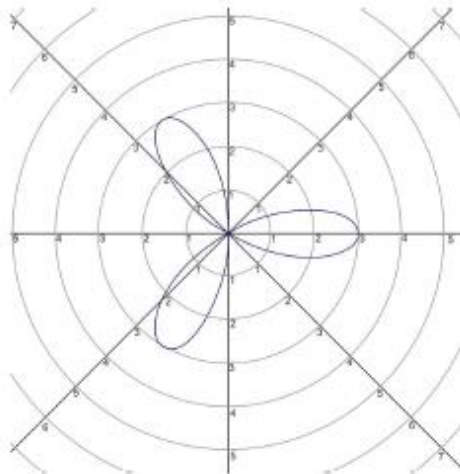
a. $r = 3 \sin 4\theta$



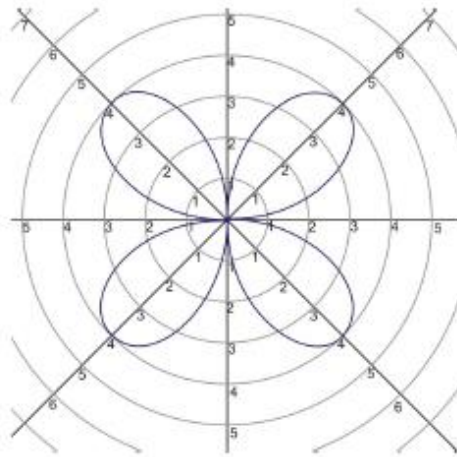
b. $r = 2 \sin 5\theta$



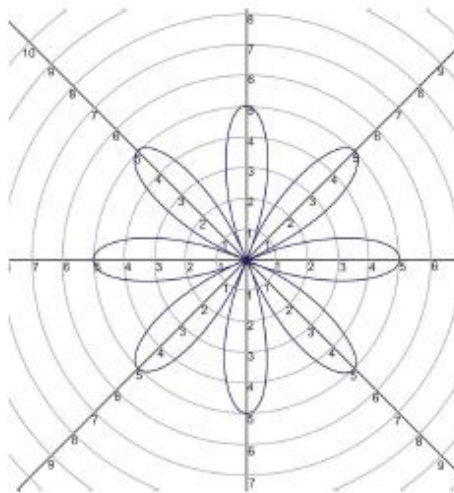
c. $r = 3 \cos 3\theta$



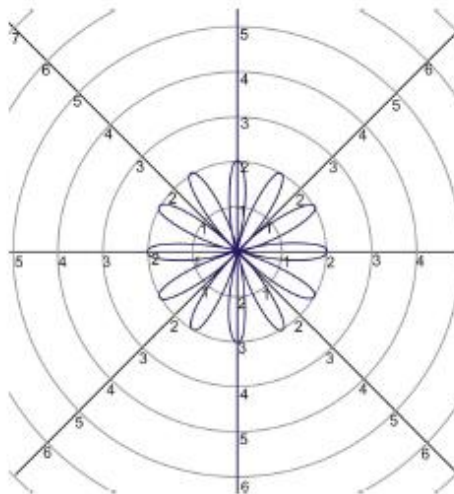
d. $r = -4 \sin 2\theta$



e. $r = 5 \cos 4\theta$



f. $r = -2 \cos 6\theta$



For roses, the general equation is $r = a \sin n\theta$ or $r = a \cos n\theta$. a indicates how long each petal is, and depending on if n is even or odd indicates the number of petals. If n is odd, there are n petals and if n is even there are $2n$ petals.