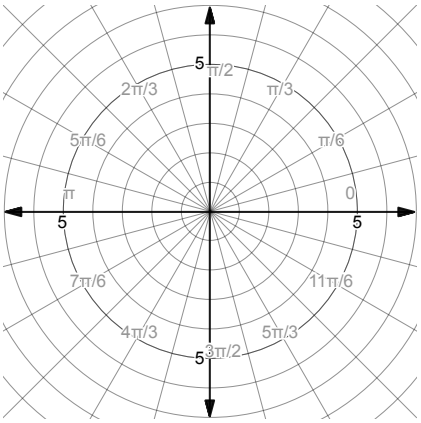
APPC Lesson 8.3 Homework

Name _____

1. Graph each polar equation on the same polar plane.

   a. $r = 3\cos\theta$

   b. $r = -6\sin\theta$



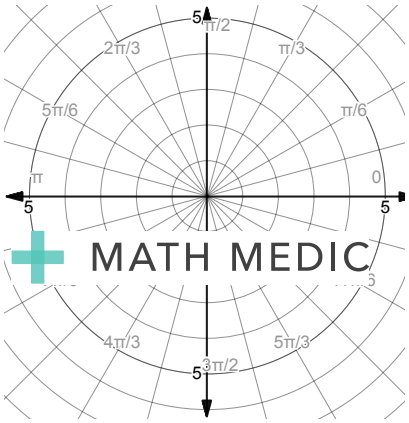
2. Determine the radius and the rectangular coordinates of the center of the circle given by $r = -15\cos\theta$.

3. Consider the function given by $r(\theta) = 4\cos(2\theta)$.

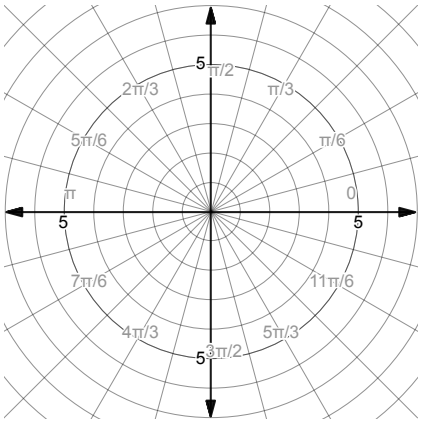
   a. Complete the table for the given values of θ .

θ	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{5\pi}{6}$	π	$\frac{7\pi}{6}$	$\frac{3\pi}{2}$
$r(\theta)$								

   b. Sketch the graph.



4. Graph $r = 4\sin(5\theta)$.



5. Consider the graph of $r = 9\cos(3\theta)$ for $0 \leq \theta \leq \pi$.

a. What is the maximum value of this function?

b. For which value(s) of θ does this occur?

6. Consider the graph of the polar rose curve given by $r = 9\sin(4\theta)$.

a. What is the length of each petal?

b. How many petals are there?

c. What kind of symmetry does the graph have?

d. For $0 \leq \theta \leq 2\pi$, what is the smallest value of θ for which $9\sin(4\theta) = 9$?

e. What does your answer to part d reveal about the graph of the rose?

7. Which polar rose has the greatest number of petals?

A) $r = 10\sin(5\theta)$

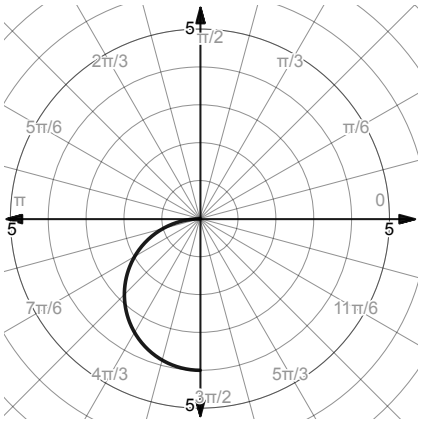
B) $r = -5\cos(6\theta)$

C) $r = 2\cos(7\theta)$

D) $r = 12\sin(4\theta)$

8. Explain why all graphs of the form $r = a\cos\theta$ where $a > 0$ have no points in the second or third quadrant.

9. Write a polar equation for the graph shown. Consider any necessary domain restrictions.



10. Consider the graph of the polar function $r(\theta) = 3 + 6\sin(2\theta)$ on the interval $0 \leq \theta \leq \pi$.

a. Which is greater: $r\left(\frac{\pi}{6}\right)$ or $r\left(\frac{\pi}{2}\right)$? Justify your answer.

b. For which value(s) of θ is $r(\theta) = 0$?

c. Find all coordinate pairs where the graph intersects the horizontal axis.

d. Are your answers to parts b and c the same? How does this compare to the Cartesian coordinate system?

11. Determine if the statement below is always, sometimes, or never true. Justify your answer.

For positive integers a and n, the graph of $r = a\cos(n\theta)$ will look identical to the graph of $r = -a\cos(n\theta)$.