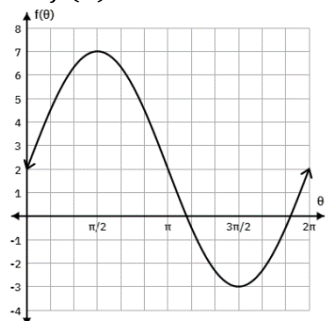


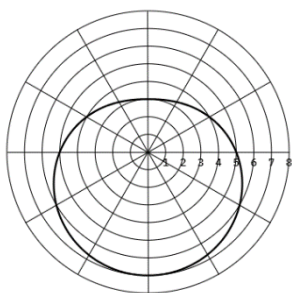
Polar Graphs Part 1 (3.15) Homework

Numbered below are four functions and the corresponding rectangular graphs. Below that are the corresponding polar graphs, each labelled with a letter. Match the letter of each polar graph with the correct equation/rectangular graph.

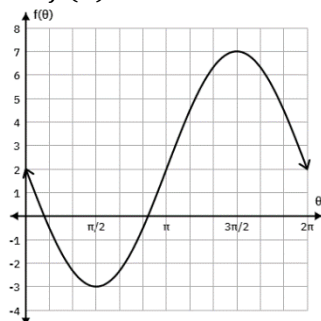
1. $f(\theta) = 2 + 5 \sin \theta$



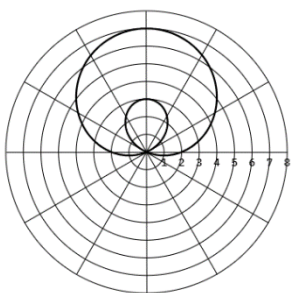
(A)



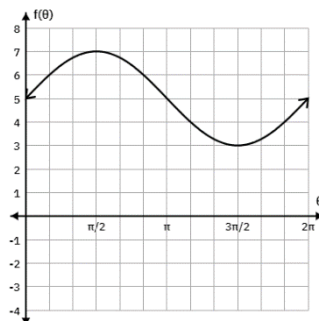
2. $f(\theta) = 2 - 5 \sin \theta$



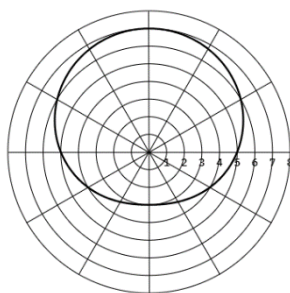
(B)



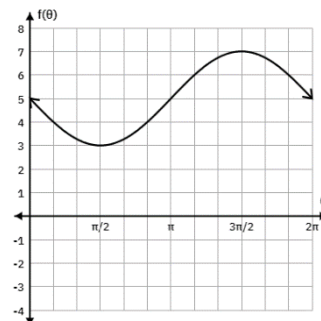
3. $r = 5 + 2 \sin \theta$



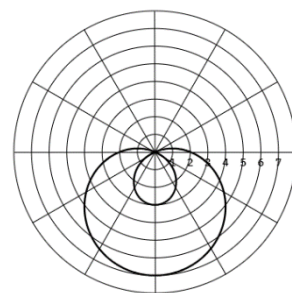
(C)



4. $5 - 2 \sin \theta$



(D)



Consider the graph of $r = f(\theta)$ graphed to the right. For each statement below, determine if the statement is possible or impossible.

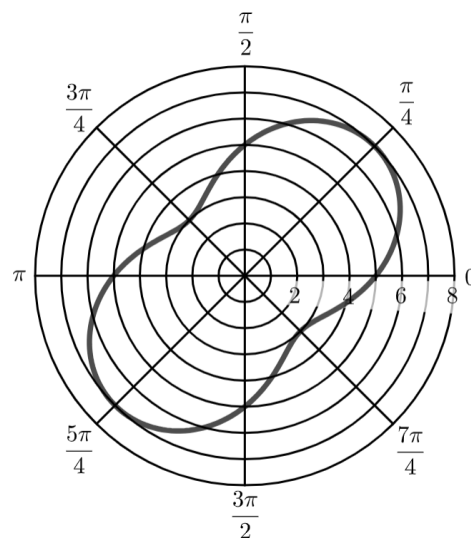
5. $f(\theta)$ is positive and increasing on the interval $0 \leq \theta \leq \frac{\pi}{4}$

6. $f(\theta)$ is negative and decreasing on the interval $\frac{\pi}{4} \leq \theta \leq \frac{3\pi}{4}$

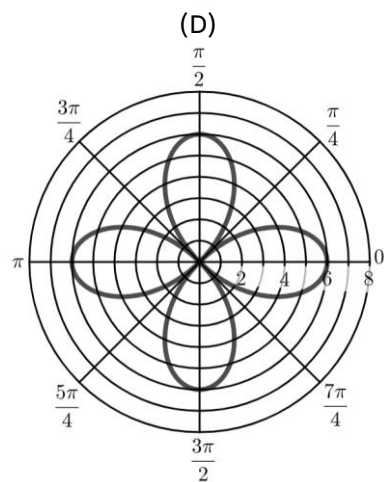
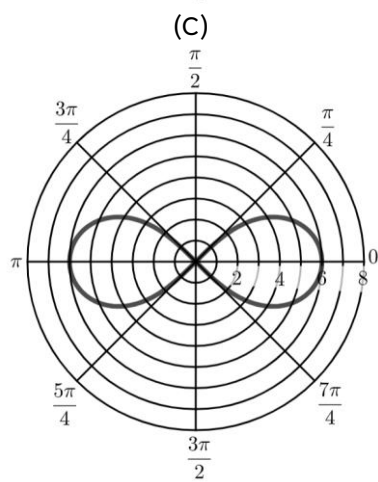
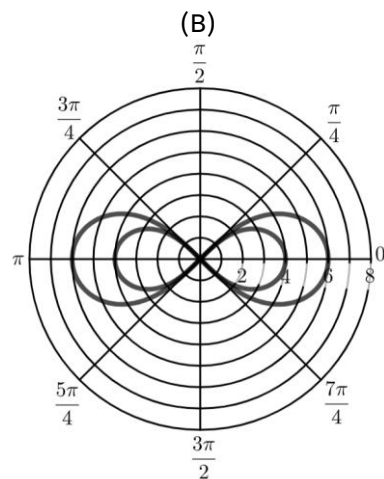
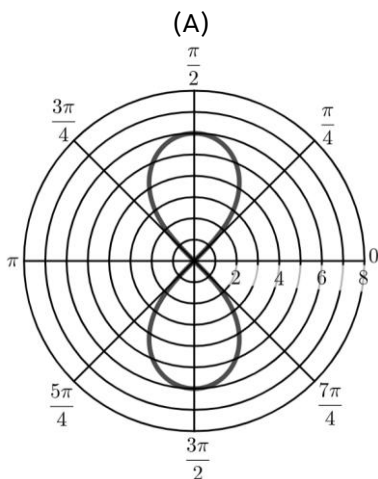
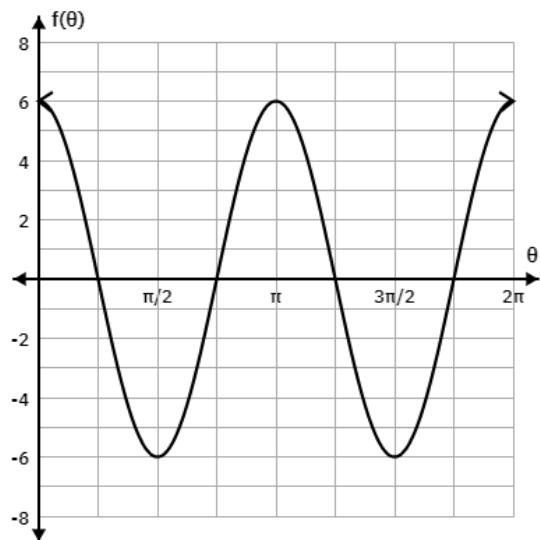
7. $f(\theta)$ is negative and decreasing on the interval $\frac{3\pi}{4} \leq \theta \leq \frac{5\pi}{4}$

8. $f(\theta)$ is positive and decreasing on the interval $\frac{5\pi}{4} \leq \theta \leq \frac{7\pi}{4}$

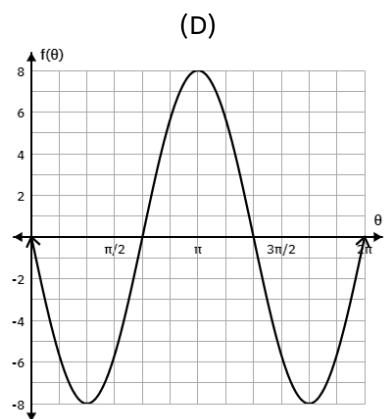
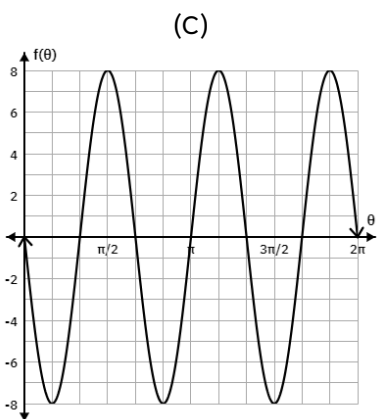
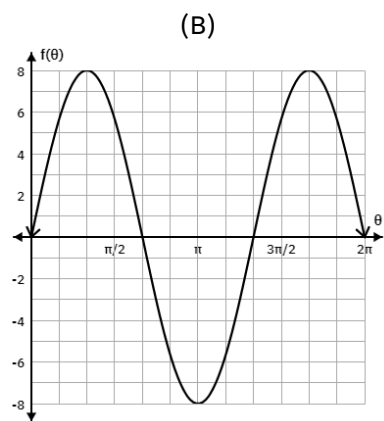
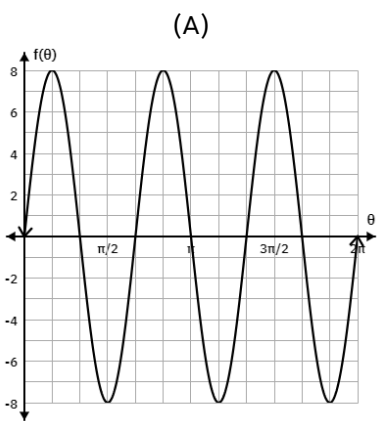
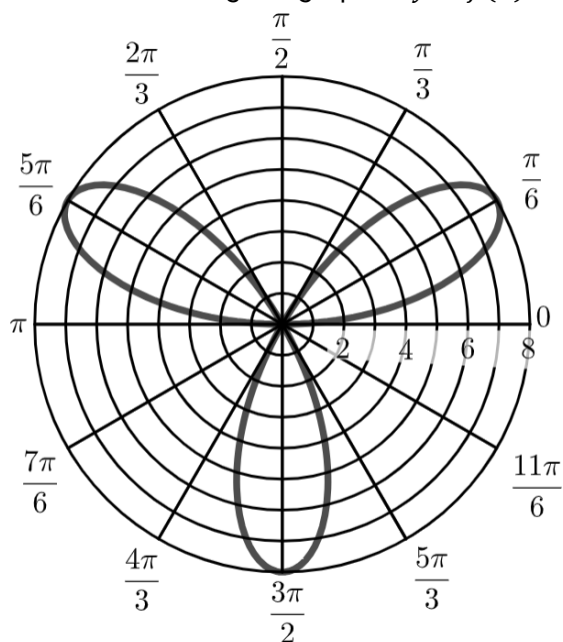
9. $f(\theta)$ has two zeros on the interval $0 \leq \theta \leq 2\pi$



10. Below is the rectangular graph of the function $f(\theta) = 6 \cos(2\theta)$. From the options to the right, select the correct polar graph of $r = f(\theta)$.

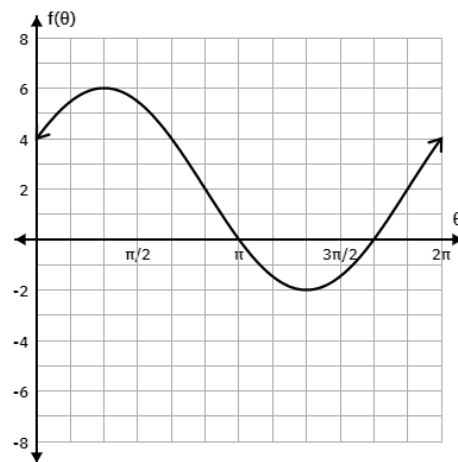


11. Below is the polar graph $r = f(\theta)$. From the options to the right, select the correct rectangular graph of $y = f(\theta)$.



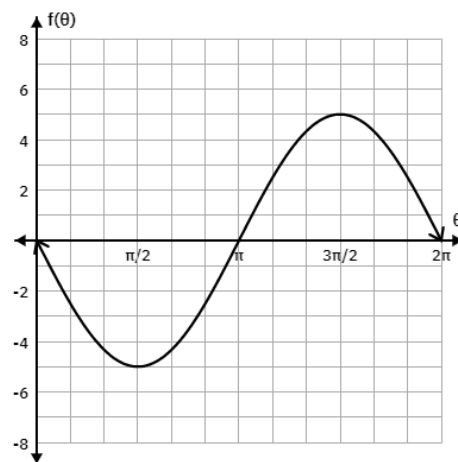
12. To the right is the rectangular graph of $y = f(\theta)$. If $r = f(\theta)$ is graphed in the polar coordinate system over $0 \leq \theta \leq 2\pi$, on what interval or intervals would the distance between $f(\theta)$ and the origin be decreasing?

(the spacing between θ -value grid lines in the provided graph is $\frac{\pi}{6}$)

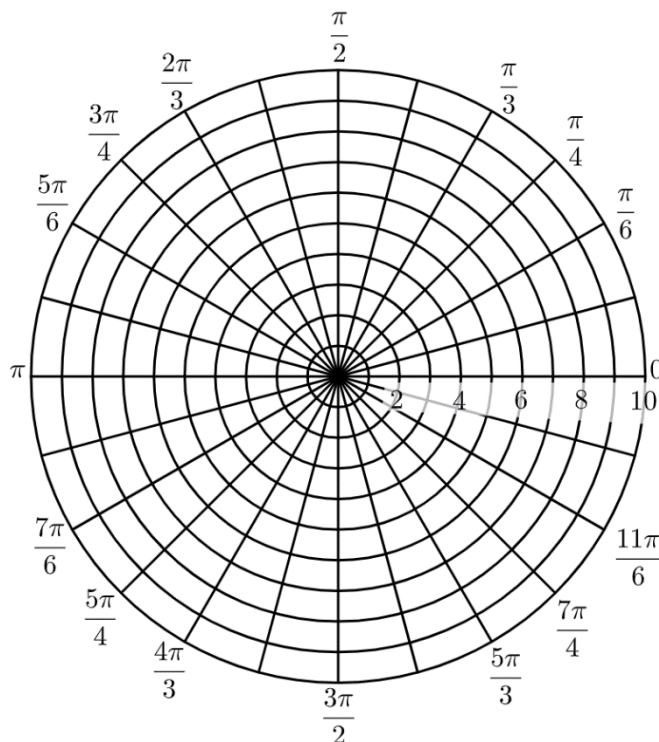
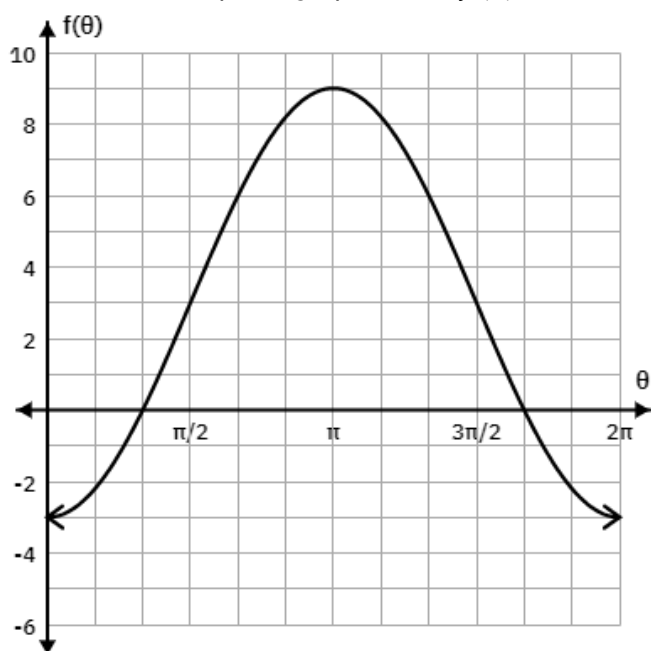


13. To the right is the rectangular graph of $y = f(\theta)$. If $r = f(\theta)$ is graphed in the polar coordinate system over $0 \leq \theta \leq 2\pi$, on what interval or intervals would the distance between $f(\theta)$ and the origin be increasing?

(the spacing between θ -value grid lines in the provided graph is $\frac{\pi}{6}$)



14. The function f is given by $f(\theta) = 3 - 6 \cos(\theta)$. Use the below rectangular graph of $y = f(\theta)$ to construct the polar graph of $r = f(\theta)$.



Polar Graphs Part 1 HW Answers

1. B
2. D
3. C
4. A
5. Possible. The dark blue piece moving away from the origin supports this statement as the distance to the origin increases.
6. Impossible. The purple piece contradicts this as the distance to the origin decreases rather than increases.
7. Possible. The yellow and dark blue pieces support this statement as the distance to the origin increases.
8. Possible. The purple piece supports this statement as the distance to the origin decreases.
9. Impossible. Zeros of $f(\theta)$ would appear as points at the origin on the polar graph. This polar graph never intersects the origin.
10. D
11. A
12. $\frac{\pi}{3} \leq \theta \leq \pi$ and $\frac{4\pi}{3} \leq \theta \leq \frac{5\pi}{3}$
13. $0 \leq \theta \leq \frac{\pi}{2}$ and $\pi \leq \theta \leq \frac{3\pi}{2}$
- 14.

