

9.9 Area Bounded by Two Polar Curves

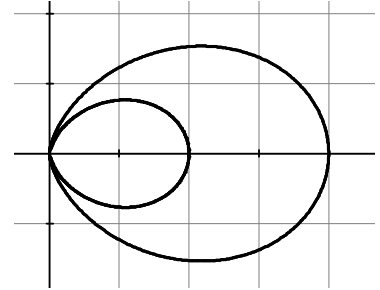
Calculus

Name: _____

CA #1

1. What is the total area between the polar curves $r = 2 \sin 3\theta$ and $r = 5 \sin 3\theta$.

2. The figure to the right shows the graphs of the polar curves $r = 2 \cos^2 \theta$ and $r = 4 \cos^2 \theta$ for $-\frac{\pi}{2} \leq \theta \leq \frac{\pi}{2}$. Which of the following integrals gives the area of the region bounded between the two polar curves?

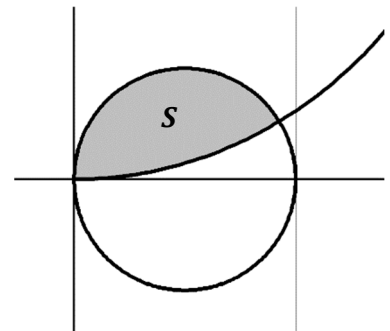


- A. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos^2 \theta d\theta$
 B. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} 6 \cos^4 \theta d\theta$
 C. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} 2 \cos^4 \theta d\theta$
 D. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} 2 \cos^2 \theta d\theta$

3. Find the total area in the first quadrant of the common interior of $r = 4 \sin 2\theta$ and $r = 2$.

4. Find the area of the common interior of the polar graphs $r = 3 \cos \theta$ and $r = 3 \sin \theta$.

5. Let S be the region in the 1st Quadrant bounded above by the graph of the polar curve $r = \cos \theta$ and bounded below by the graph of the polar curve $r = \frac{7}{2}\theta$, as shown in the figure. The two curves intersect when $\theta = 0.275$. What is the area of S ?



1. 16.493	2. B	3. 2.457	4. $1.284 \text{ or } \frac{8}{9} - \frac{1}{9}$	5. 0.301
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