

9.9 Area Bounded by Two Polar Curves

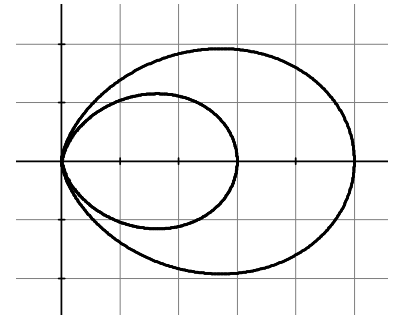
Calculus

Name: _____

CA #2

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

2. The figure shows the graphs of the polar curves $r = 3 \cos^2 \theta$ and $r = 5 \cos^2 \theta$ 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?

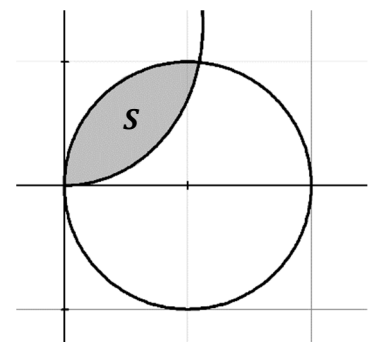


- A. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} 2 \cos^4 \theta \, d\theta$
- B. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} 2 \cos^2 \theta \, d\theta$
- C. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} 8 \cos^2 \theta \, d\theta$
- D. $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} 8 \cos^4 \theta \, d\theta$

3. Find the total area in the first quadrant of the common interior of $r = 6 \sin 2\theta$ and $r = 3$.

4. Find the area of the common interior of the polar graphs $r = 5 \cos \theta$ and $r = 5 \sin \theta$.

5. Let S be the region in the 1st Quadrant bounded above by the graph of the polar curve $r = 2 \cos \theta$ and bounded below by the graph of the polar curve $r = 2\theta$, as shown in the figure above. The two curves intersect when $\theta = 0.739$. What is the area of S ?



1. 3.927	2. D	3. 5.528	4. 3.567 or $\frac{8}{25} - \frac{4}{25\pi}$	5. 0.603
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