

10.5 Q's

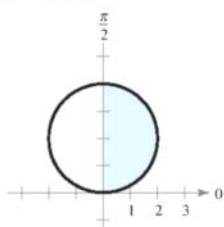
Thursday, April 30, 2015 9:37 PM

10.5 Exercises

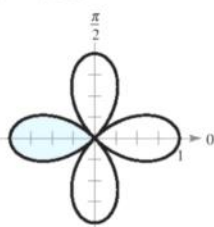
See CalcChat.com for tutorial help and worked-out solutions to odd-numbered exercises.

Area of a Polar Region In Exercises 1–4, write an integral that represents the area of the shaded region of the figure. Do not evaluate the integral.

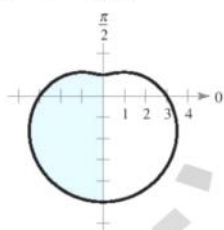
1. $r = 4 \sin \theta$



2. $r = \cos 2\theta$



3. $r = 3 - 2 \sin \theta$



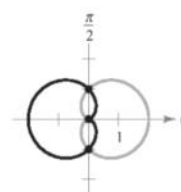
4. $r = 1 - \cos \theta$



Finding Points of Intersection In Exercises 25–32, find the points of intersection of the graphs of the equations.

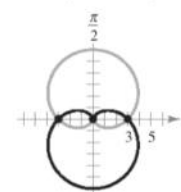
25. $r = 1 + \cos \theta$

$r = 1 - \cos \theta$



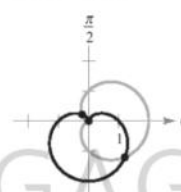
26. $r = 3(1 + \sin \theta)$

$r = 3(1 - \sin \theta)$



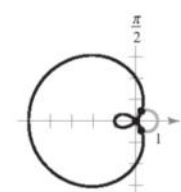
27. $r = 1 + \cos \theta$

$r = 1 - \sin \theta$



28. $r = 2 - 3 \cos \theta$

$r = \cos \theta$



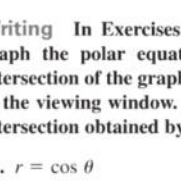
29. $r = 4 - 5 \sin \theta$

$r = 3 \sin \theta$

$r = \frac{\theta}{2}$

$r = 2$

$r = 2$



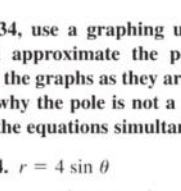
30. $r = 3 + \sin \theta$

$r = 2 \csc \theta$

32. $\theta = \frac{\pi}{4}$

$r = 2$

$r = 2$



Finding the Area of a Polar Region In Exercises 5–16, find the area of the region.

5. Interior of $r = 6 \sin \theta$

6. Interior of $r = 3 \cos \theta$

7. One petal of $r = 2 \cos 3\theta$

8. One petal of $r = 4 \sin 3\theta$

9. One petal of $r = \sin 2\theta$

10. One petal of $r = \cos 5\theta$

11. Interior of $r = 1 - \sin \theta$

12. Interior of $r = 1 - \sin \theta$ (above the polar axis)

13. Interior of $r = 5 + 2 \sin \theta$

14. Interior of $r = 4 - 4 \cos \theta$

15. Interior of $r^2 = 4 \cos 2\theta$

16. Interior of $r^2 = 6 \sin 2\theta$

Graphing Finding the Area of a Polar Region In Exercises 17–24, use a graphing utility to graph the polar equation. Find the area of the given region analytically.

17. Inner loop of $r = 1 + 2 \cos \theta$

18. Inner loop of $r = 2 - 4 \cos \theta$

19. Inner loop of $r = 1 + 2 \sin \theta$

20. Inner loop of $r = 4 - 6 \sin \theta$

21. Between the loops of $r = 1 + 2 \cos \theta$

22. Between the loops of $r = 2(1 + 2 \sin \theta)$

23. Between the loops of $r = 3 - 6 \sin \theta$

24. Between the loops of $r = \frac{1}{2} + \cos \theta$

Graphing Writing In Exercises 33 and 34, use a graphing utility to graph the polar equations and approximate the points of intersection of the graphs. Watch the graphs as they are traced in the viewing window. Explain why the pole is not a point of intersection obtained by solving the equations simultaneously.

33. $r = \cos \theta$

$r = 2 - 3 \sin \theta$

34. $r = 4 \sin \theta$

$r = 2(1 + \sin \theta)$

Graphing Finding the Area of a Polar Region Between Two Curves In Exercises 35–42, use a graphing utility to graph the polar equations. Find the area of the given region analytically.

35. Common interior of $r = 4 \sin 2\theta$ and $r = 2$

36. Common interior of $r = 2(1 + \cos \theta)$ and $r = 2(1 - \cos \theta)$

37. Common interior of $r = 3 - 2 \sin \theta$ and $r = -3 + 2 \sin \theta$

38. Common interior of $r = 5 - 3 \sin \theta$ and $r = 5 - 3 \cos \theta$

39. Common interior of $r = 4 \sin \theta$ and $r = 2$

40. Common interior of $r = 2 \cos \theta$ and $r = 2 \sin \theta$

41. Inside $r = 2 \cos \theta$ and outside $r = 1$

42. Inside $r = 3 \sin \theta$ and outside $r = 1 + \sin \theta$