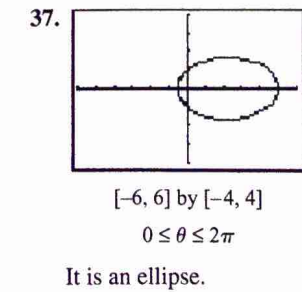
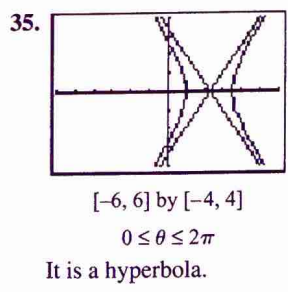
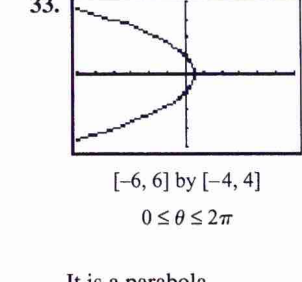
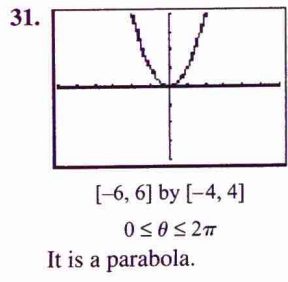
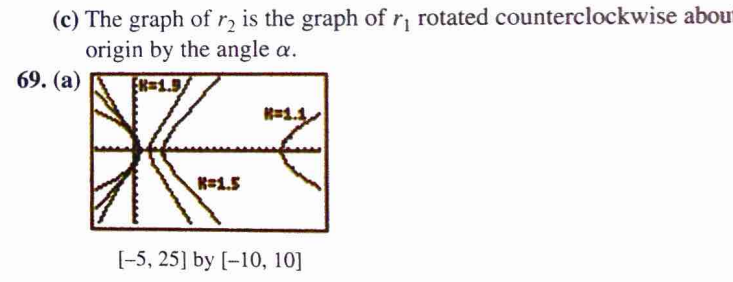


- 21. $y = 4$, a horizontal line
- 23. $x + y = 1$, a line (slope = -1, y-intercept = 1)
- 25. $y - 2x = 5$, a line (slope = 2, y-intercept = 5)
- 27. $x^2 = y^2$, the union of two lines: $y = \pm x$
- 29. $x^2 + (y - 4)^2 = 16$, a circle (center = (0, 4), radius = 4)



- 39. At $\theta = 0$: -1
At $\theta = \pi$: 1
- 41. At (2, 0): -2/3
At (-1, $\pi/2$): 0
At (2, π): 2/3
At (5, $3\pi/2$): 0
- 43. 18π 45. $\pi/8$ 47. 2
- 53. $5\pi - 8$ 55. $8 - \pi$
- 49. 11π 51. $(\pi/2) - 1$



The graphs are hyperbolas.
(b) As $k \rightarrow 1^+$, the right branch of the hyperbola goes to infinity and appears. The left branch approaches the parabola $y^2 = 4 - 4x$.

71. $d = [(x_2 - x_1)^2 + (y_2 + y_1)^2]^{1/2}$
 $= [(r_2 \cos \theta_2 - r_1 \cos \theta_1)^2 + (r_2 \sin \theta_2 - r_1 \sin \theta_1)^2]^{1/2}$
and then simplify using trigonometric identities.

73. $(dx/d\theta)^2 + (dy/d\theta)^2$
 $= (f'(\theta) \cos \theta - f(\theta) \sin \theta)^2 + (f'(\theta) \sin \theta + f(\theta) \cos \theta)^2$
 $= (f'(\theta) \cos \theta)^2 + (f(\theta) \sin \theta)^2 + (f'(\theta) \sin \theta)^2 + (f(\theta) \cos \theta)^2$
 $= (f(\theta))^2 (\sin^2 \theta + \cos^2 \theta) + (f'(\theta))^2 (\cos^2 \theta + \sin^2 \theta)$
 $= (f(\theta))^2 + (f'(\theta))^2 = r^2 + (dr/d\theta)^2$

Quick Quiz (Sections 10.1-10.3)

- 1. A 3. D

Chapter 10 Review Exercises

- 1. (a) $\langle -17, 32 \rangle$ (b) $\sqrt{1313}$ 2. (a) $\langle -1, -1 \rangle$ (b) $\sqrt{2}$
- 3. (a) $\langle 6, -8 \rangle$ (b) 10 4. (a) $\langle 10, -25 \rangle$ (b) $\sqrt{725} = 5\sqrt{29}$
- 5. $\langle -\sqrt{3}/2, -1/2 \rangle$ [assuming counterclockwise] 6. $\langle \sqrt{3}/2, 1/2 \rangle$
- 7. $\langle 8/\sqrt{17}, -2/\sqrt{17} \rangle$ 8. $\langle -3, -4 \rangle$
- 9. (a) $y = \frac{\sqrt{3}}{2}x + \frac{1}{4}$ (b) $1/4$ 10. (a) $y = -3x + \frac{13}{4}$ (b) 6
- 11. (a) (0, 1/2) and (0, -1/2) (b) Nowhere