

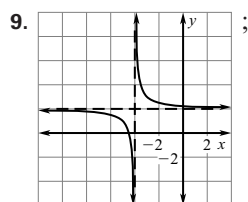
- 9.6 PRACTICE (pp. 571–573)** 5. $-\frac{8}{3}$ 7. $\frac{3}{2}$ 9. -5 11. $-15, 0$
 13. 0 15. no 17. no 19. yes 21. 2 23. $-1, \frac{1}{4}$ 25. $-\frac{2}{3}, 2$
 27. $-\frac{3}{2}, 2$ 29. $\frac{5}{7}, 3$ 31. -3 33. $\frac{6}{17}$ 35. $-4, 4$ 37. 2, 5
 39. 4 41. $-\frac{3}{2}, 5$ 43. -5 45. no solution 47. $-2, 0$ 49. 2, 6
 51. Always; when you solve by cross multiplying, you get $x = 1$ or $x = a$ and $x = a$ makes both fractions undefined.
 53. Always; when you multiply each side of the equation by $x^2 - a^2$, you get $x = a$, making the fractions undefined.
 55. 87 57. about 2198 flies/m³ 59. \$16.50

- 9.6 MIXED REVIEW (p. 573)** 63. 1; -1 65. $-\frac{2}{3}, \frac{3}{2}$ 67. $\frac{1}{2}; -2$
 69. $4\sqrt{3}$ 71. $6\sqrt{3}$ 73. $3\sqrt{30}$ 75. 15 77. 6.796

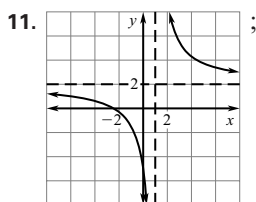
- QUIZ 2 (p. 574)** 1. $\frac{5x^5y}{3}$ 2. $\frac{x-8}{5x}$ 3. $\frac{2x^2}{(x-9)(x+4)}$
 4. $\frac{16x^2-5x+6}{2(5x-6)(5x+6)}$ 5. $\frac{-6(11x+8)}{6x-1}$ 6. -6
 7. $\frac{-3(x-3)(2x-1)(2x+1)}{(x-1)(x+1)}$ 8. $\frac{2x}{(x-5)(x+1)}$ 9. 20 dozen

CHAPTER 9 REVIEW (pp. 576–578)

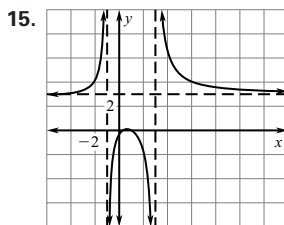
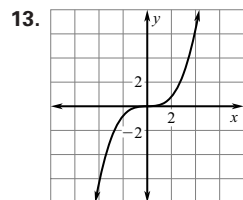
1. $y = \frac{5}{x}$; 2.5 3. $y = \frac{2}{x}$; 1 5. $z = \frac{1}{3}xy$; -10 7. $z = 3xy$; -90



domain: all real numbers; except -4 ; range: all real numbers except 2



domain: all real numbers; except 1; range: all real numbers except 2



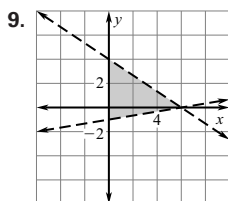
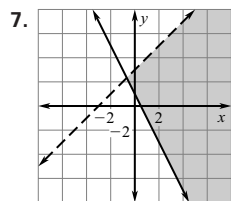
17. $5(x-6)(x+3)(x-3)$ 19. $\frac{x^3+5}{x^2(x-2)}$

21. $\frac{-9x^2+18x-10}{5x(x-1)(x+5)}$ 23. $\frac{x(x-8)}{2(9x+2)}$ 25. $\frac{12}{5}$

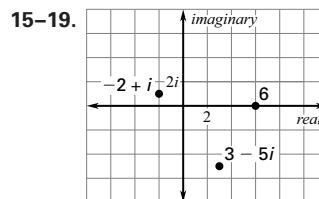
27. $\frac{3}{2}$ 29. no solution 31. $-4, 1$

CUMULATIVE PRACTICE (pp. 582–583)

1. $y = 3x - \frac{7}{2}$ 3. $y = -\frac{5}{6}x + 25$ 5. parallel

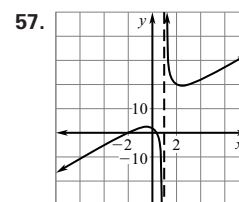
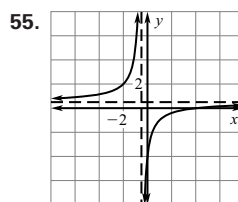
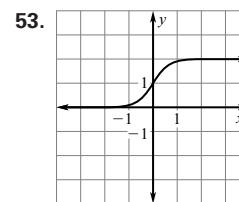
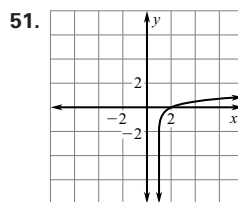
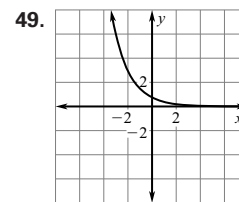
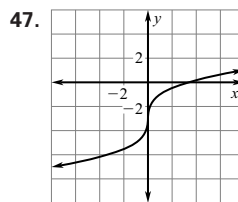


11. $\begin{bmatrix} 12 & -2 \\ -12 & 2 \end{bmatrix}$ 13. $\begin{bmatrix} -2 & -8 \\ 17 & 30 \end{bmatrix}$



15. $\sqrt{5}$ 17. 6 19. $\sqrt{34}$
 21. 5 23. $\frac{3x^4}{10}$
 25. $2ab\sqrt[4]{bc}$ 27. $\frac{1}{8e^6}$
 29. 2 31. $\frac{1}{5}$ 33. $\frac{1}{2}$

35. $-x^2 + 2x + 13$; all real numbers
 37. $-2x^2 - 15$; all real numbers 39. $f^{-1}(x) = 2(x+6)$
 41. $f^{-1}(x) = 5^x$ 43. $\log(3x^2y^3)$ 45. $\ln(x^2y^2)$

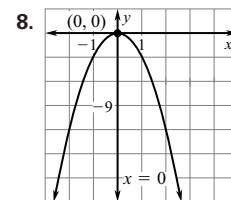
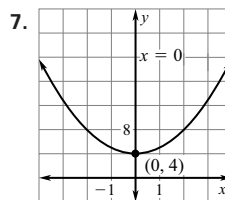


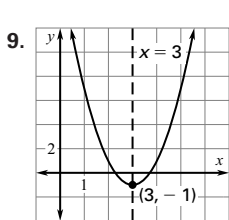
59. 10 61. $-\frac{9\sqrt{3}}{2}$ 63. $\ln 8 \approx 2.079$ 65. $-\frac{9}{5}$
 67. $y = \frac{5}{32}(2)^x$ 69. $y = 0.759(1.737)^x$ 71. $y = 1.651x^{0.861}$
 73. $y = 1.704x^{0.231}$ 75. $\frac{6x^3 + 7x^2 - 20x - 9}{2x(x-1)(3x+1)}$
 77. about 3.5 sec 81. $f = \frac{kq_1q_2}{r^2}$

CHAPTER 10

SKILL REVIEW (p. 588) 1. $y = 2x + 4$ 2. $y = \frac{1}{3}x - \frac{8}{3}$

3. $y = -\frac{3}{4}x - 2$ 4. (2, 3) 5. (-1, 5) 6. (4, 9)

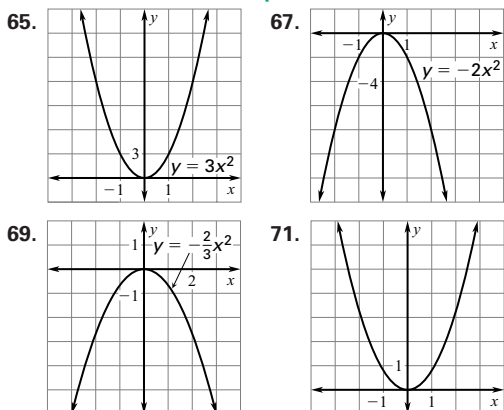




10. $-4 \pm \sqrt{2}$ 11. $-\frac{3}{2} \pm \frac{\sqrt{11}}{2}i$
 12. $-3 \pm \sqrt{23}$

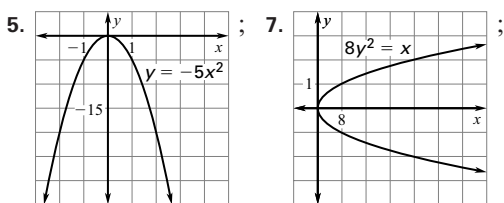
- 10.1 PRACTICE** (pp. 592–594) 5. 5 7. $3\sqrt{5} \approx 6.71$
 9. $3\sqrt{34} \approx 17.49$ 11. (2, 6) 13. (2, 7) 15. $(-\frac{9}{2}, -\frac{1}{2})$
 17. 5; $(\frac{3}{2}, 2)$ 19. $\sqrt{113} \approx 10.63$; $(4, \frac{1}{2})$ 21. $5\sqrt{5} \approx 11.18$;
 $(2, \frac{3}{2})$ 23. $2\sqrt{58} \approx 15.23$; (-2, -1) 25. $2\sqrt{13} \approx 7.21$;
 (5, 1) 27. $\sqrt{115.25} \approx 10.74$; (1.25, -1.3) 29. 2.5; (-6.25, 3)
 31. $\sqrt{\frac{377}{8}} \approx 6.86$; $(\frac{17}{8}, \frac{1}{8})$ 33. isosceles 35. scalene
 37. scalene 39. scalene 41. $y = -\frac{1}{3}x + \frac{28}{3}$ 43. $y = \frac{4}{15}x + \frac{61}{30}$
 45. $y = \frac{2}{15}x - 2.22$ 47. -5; 5 49. -15; -1 51. $(\frac{25}{2}, \frac{35}{2})$;
 $(\frac{75}{2}, \frac{35}{2})$ 53. about 18.97 mi 55. about 11.40 mi
 57. r is about 58.56 m, v is about 20 m/sec.

10.1 MIXED REVIEW (p. 594)

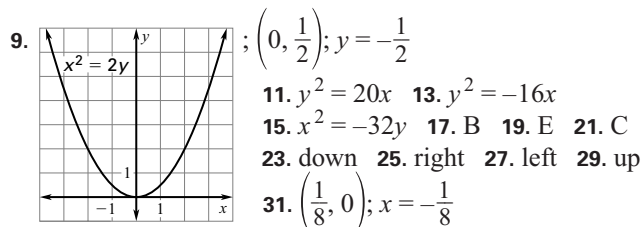


73. 525 75. 1 77. $4^{2/3} \approx 2.52$ 79. $\frac{x+6}{3x^2}$ 81. $\frac{-x^2+4x+9}{x^2+3x}$
 83. $\frac{-6x^2+x-11}{(x-6)(2x+1)}$

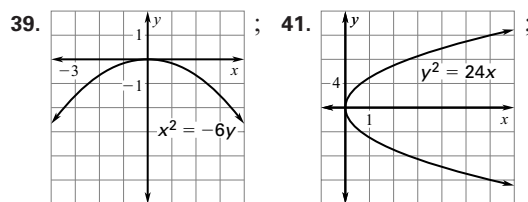
10.2 PRACTICE (pp. 598–600)



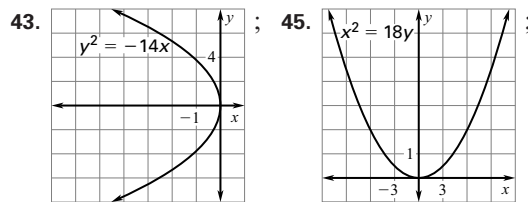
$(0, -\frac{1}{20})$; $y = \frac{1}{20}$ $(\frac{1}{32}, 0)$; $x = -\frac{1}{32}$



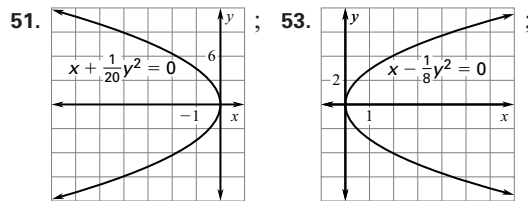
9. $(0, \frac{1}{2})$; $y = -\frac{1}{2}$
 11. $y^2 = 20x$ 13. $y^2 = -16x$
 15. $x^2 = -32y$ 17. B 19. E 21. C
 23. down 25. right 27. left 29. up
 31. $(\frac{1}{8}, 0)$; $x = -\frac{1}{8}$



33. $(-\frac{5}{2}, 0)$; $x = \frac{5}{2}$ 35. (0, -9); $y = 9$ 37. (0, 7); $y = -7$
 39. $(0, -\frac{3}{2})$; $y = \frac{3}{2}$ 41. (6, 0); $x = -6$



43. $(-\frac{7}{2}, 0)$; $x = \frac{7}{2}$ 45. $(0, \frac{9}{2})$; $y = -\frac{9}{2}$

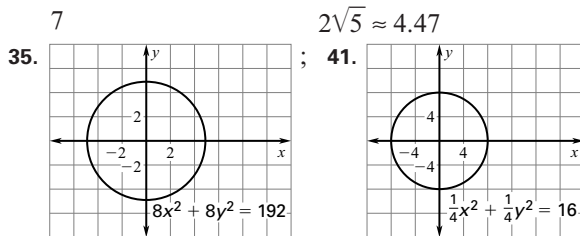
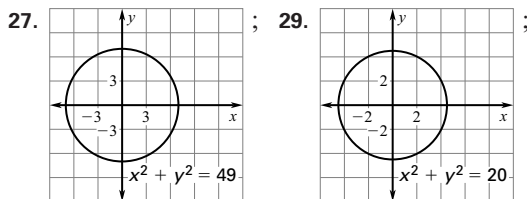
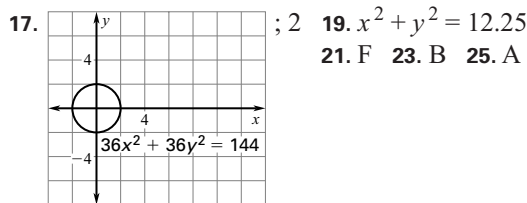
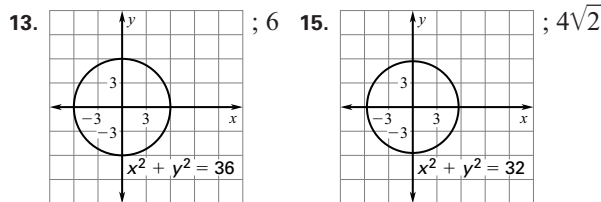


51. $(-5, 0)$; $x = 5$ 53. (2, 0); $x = -2$
 55. $y^2 = -8x$ 57. $x^2 = 4y$ 59. $x^2 = -12y$ 61. $y^2 = -20x$
 63. $x^2 = -\frac{3}{2}y$ 65. $y^2 = \frac{5}{3}x$ 67. $x^2 = 12y$ 69. $y^2 = -24x$
 71. $x^2 = 4y$ 73. $x^2 = -16y$ 75. $y^2 = -3x$ 77. $x^2 = \frac{1}{3}y$
 79. $y^2 = 6x$; 2.04 in. 81. 2.25 in.

10.2 MIXED REVIEW (p. 600) 85. $\frac{4}{7}$ 87. about 1.209

89. no solution 91. $\frac{y^3}{2x^3}$ 93. $x + 3$ 95. $\frac{1}{6x^2}$
 97. $3\sqrt{2} \approx 4.243$ 99. $\sqrt{569} \approx 23.854$ 101. $\sqrt{1733} \approx 41.629$
 103. $A = 1.5p$

10.3 PRACTICE (pp. 604–606) 5. $x^2 + y^2 = 16$
 7. $x^2 + y^2 = 100$ 9. $x^2 + y^2 = 117$ 11. $x^2 + y^2 = 50$

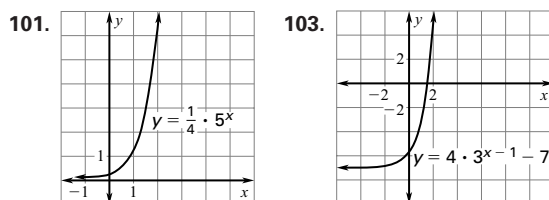


$2\sqrt{6} \approx 4.90$

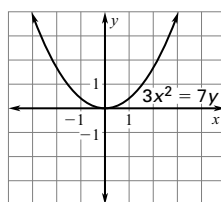
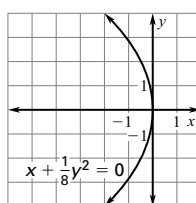
47. $x^2 + y^2 = 9$ 49. $x^2 + y^2 = 36$ 51. $x^2 + y^2 = 7$
53. $x^2 + y^2 = 11$ 55. $x^2 + y^2 = 150$ 57. $x^2 + y^2 = 28$
59. $x^2 + y^2 = 100$ 61. $x^2 + y^2 = 25$ 63. $x^2 + y^2 = 34$
65. $x^2 + y^2 = 37$ 67. $x^2 + y^2 = 65$ 69. $x^2 + y^2 = 89$
71. $y = -\frac{1}{3}x + \frac{10}{3}$ 73. $y = -\frac{4}{5}x - \frac{41}{5}$ 75. $y = 8x + 65$
77. $y = -\frac{5}{6}x - \frac{61}{3}$ 79. $y = \frac{2}{3}x - \frac{13}{3}$; they have opposite
slopes and intercepts. 81. yes; about 7.92 mi 83. 16 mm
85. 36 in. 87. about 3.6 min

10.3 MIXED REVIEW (p. 607)

91. $(-2, -3)$ 93. $(-2, -2)$ 95. $(7, 2)$
97. $f(g(x)) = 2x + 1$; $g(f(x)) = 2x + 2$
99. $f(g(x)) = -x^2 - 10x - 26$; $g(f(x)) = -x^2 + 4$



107. $\begin{bmatrix} 35 & 52 \\ 112 & 40 \\ 95 & 63 \end{bmatrix}$

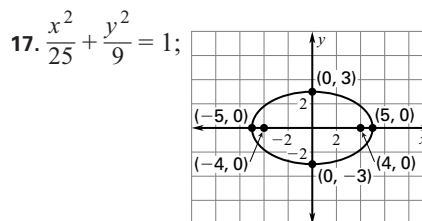
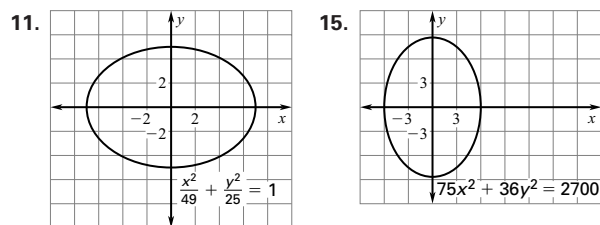
- QUIZ 1 (p. 607)** 1. 10; $(4, 3)$ 2. $6\sqrt{2} \approx 8.485$; $(0, 0)$ 3. $5\sqrt{13} \approx 18.028$; $(1, -\frac{3}{2})$ 4. $2\sqrt{17} \approx 8.246$; $(-1, -8)$ 5. $2\sqrt{37} \approx 12.166$; $(2, 5)$ 6. $4\sqrt{58} \approx 30.463$; $(5, 1)$ 7. $(\frac{3}{2}, 0)$; $x = -\frac{3}{2}$
8. $(0, \frac{3}{4})$; $y = -\frac{3}{4}$ 9. $(0, -\frac{5}{4})$; $y = \frac{5}{4}$ 10. $(-\frac{3}{8}, 0)$; $x = \frac{3}{8}$
11.  ; $(0, \frac{7}{12})$; $y = -\frac{7}{12}$
12. $(\frac{1}{16}, 0)$; $x = -\frac{1}{16}$
13.  ; $(-2, 0)$; $x = 2$
14. $(0, -3)$; $y = 3$ 15. $x^2 + y^2 = 9$
16. $x^2 + y^2 = 25$ 17. $x^2 + y^2 = 65$
18. $x^2 + y^2 = 29$ 19. $x^2 + y^2 = 82$
20. $x^2 + y^2 = 45$ 21. $x^2 + y^2 = 72$
22. $x^2 + y^2 = 113$

23. no; $\sqrt{35^2 + 56^2} \approx 66$ mi

TECHNOLOGY ACTIVITY 10.3 (p. 608) 1-9: Sample answers are given. 1. $-18 \leq x \leq 18$; $-12 \leq y \leq 12$ 3. $-36 \leq x \leq 36$; $-24 \leq y \leq 24$ 5. $-3 \leq x \leq 3$; $-2 \leq y \leq 2$ 7. $-9 \leq x \leq 9$; $-6 \leq y \leq 6$ 9. $-6 \leq x \leq 6$; $-4 \leq y \leq 4$

10.4 PRACTICE (pp. 612-614)

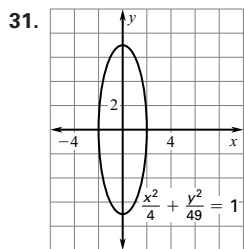
5. $\frac{x^2}{16} + \frac{y^2}{25} = 1$ 7. $\frac{x^2}{49} + \frac{y^2}{9} = 1$ 9. $\frac{x^2}{91} + \frac{y^2}{100} = 1$



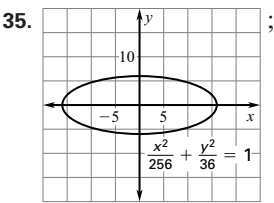
19. vertices: $(\pm 11, 0)$; co-vertices: $(0, \pm 10)$; foci: $(\pm\sqrt{21}, 0)$
21. vertices: $(0, \pm 5)$; co-vertices: $(\pm 3, 0)$; foci: $(0, \pm 4)$
23. vertices: $(\pm 2\sqrt{7}, 0)$; co-vertices: $(0, \pm 2\sqrt{5})$;
foci: $(\pm 2\sqrt{2}, 0)$ 25. $\frac{x^2}{4} + \frac{y^2}{49} = 1$; vertices: $(0, \pm 7)$;
co-vertices: $(\pm 2, 0)$; foci: $(0, \pm 3\sqrt{5})$ 27. $\frac{x^2}{10} + y^2 = 1$;

vertices: $(\pm\sqrt{10}, 0)$; co-vertices: $(0, \pm 1)$; foci: $(\pm 3, 0)$

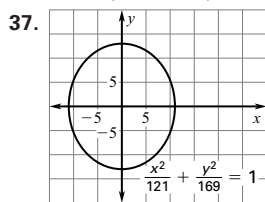
29. $\frac{x^2}{15} + \frac{y^2}{25} = 1$; vertices: $(0, \pm 5)$; co-vertices: $(\pm\sqrt{15}, 0)$; foci: $(0, \pm\sqrt{10})$



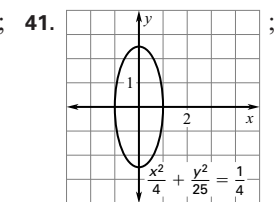
vertices: $(0, \pm 7)$;
co-vertices: $(\pm 2, 0)$;
foci: $(0, \pm 3\sqrt{5})$



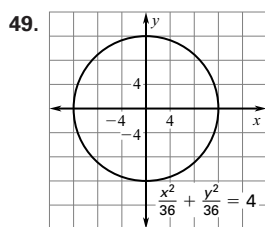
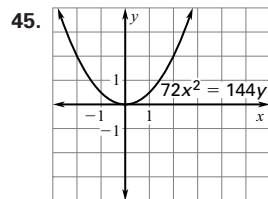
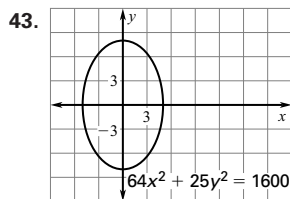
vertices: $(\pm 16, 0)$;
co-vertices: $(0, \pm 6)$;
foci: $(\pm 2\sqrt{55}, 0)$



vertices: $(0, \pm 13)$;
co-vertices: $(\pm 11, 0)$;
foci: $(0, \pm 4\sqrt{3})$



vertices: $(0, \pm 2.5)$;
co-vertices: $(\pm 1, 0)$;
foci: $(0, \pm \frac{\sqrt{21}}{2})$



51. $\frac{x^2}{25} + \frac{y^2}{36} = 1$ 53. $\frac{x^2}{16} + \frac{y^2}{9} = 1$
55. $\frac{x^2}{81} + \frac{y^2}{64} = 1$ 56. $\frac{x^2}{100} + \frac{y^2}{16} = 1$
57. $\frac{x^2}{9} + \frac{y^2}{49} = 1$ 59. $\frac{x^2}{16} + \frac{y^2}{64} = 1$
61. $\frac{x^2}{25} + \frac{y^2}{16} = 1$ 63. $\frac{x^2}{55} + \frac{y^2}{64} = 1$

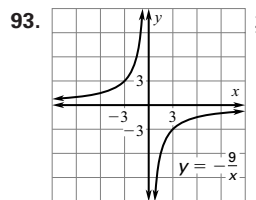
65. $\frac{x^2}{40} + \frac{y^2}{121} = 1$ 67. $\frac{x^2}{275} + \frac{y^2}{324} = 1$ 69. $\frac{x^2}{2352.25} + \frac{y^2}{529} = 1$

71. about 3500 ft² 73. $\frac{x^2}{92.5^2} + \frac{y^2}{77.5^2} = 1$

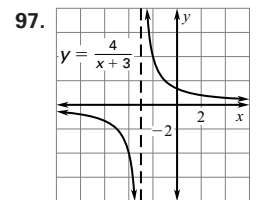
75. $3710\pi \leq A \leq 7170\pi$

10.4 MIXED REVIEW (p. 614) 79. -32 81. $\frac{1}{3}$ 83. 27

85. 16 87. $y = \frac{24}{x}$ 89. $y = \frac{72}{x}$ 91. $y = \frac{12}{x}$

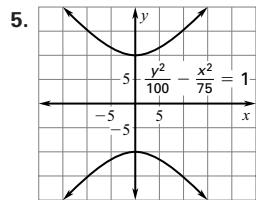


domain: all real numbers except 0; range: all real numbers except 0

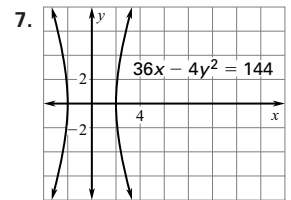


domain: all real numbers except -3; range: all real numbers except 0

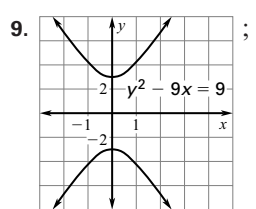
10.5 PRACTICE (pp. 618–620)



foci: $(0, \pm 5\sqrt{7})$;
asymptotes: $y = \pm \frac{2\sqrt{3}}{3}x$



foci: $(\pm 2\sqrt{10}, 0)$;
asymptotes: $y = \pm 3x$



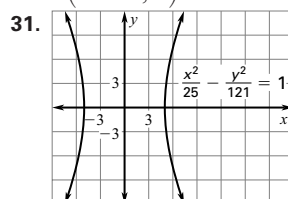
foci: $(0, \pm\sqrt{10})$;
asymptotes: $y = \pm 3x$

11. $\frac{x^2}{49} - \frac{y^2}{15} = 1$ 13. $\frac{y^2}{45} - \frac{x^2}{36} = 1$

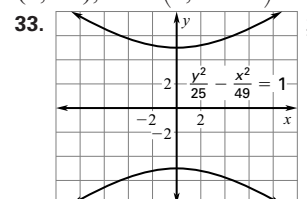
15. C 17. D 19. $\frac{x^2}{9} - \frac{y^2}{36} = 1$

21. $\frac{y^2}{(\frac{1}{4})} - \frac{x^2}{(\frac{9}{4})} = 1$ 23. $\frac{y^2}{4} - \frac{x^2}{144} = 1$

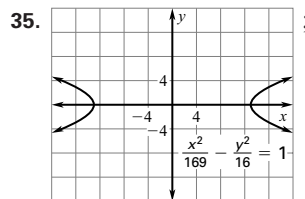
25. vertices: $(\pm 3, 0)$; foci: $(\pm\sqrt{73}, 0)$ 27. vertices: $(\pm 11, 0)$;
foci: $(\pm 5\sqrt{5}, 0)$ 29. vertices: $(0, \pm 2)$; foci: $(0, \pm\sqrt{29})$



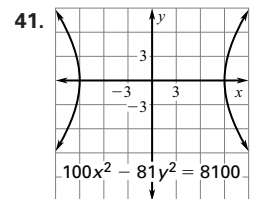
foci: $(\pm\sqrt{146}, 0)$;
asymptotes: $y = \pm \frac{11}{5}x$



foci: $(0, \pm\sqrt{74})$;
asymptotes: $y = \pm \frac{5}{7}x$



foci: $(\pm\sqrt{185}, 0)$;
asymptotes: $y = \pm \frac{4}{13}x$

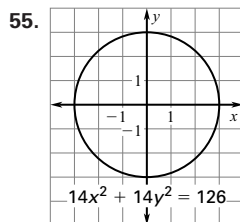
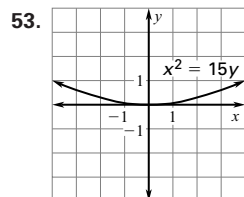
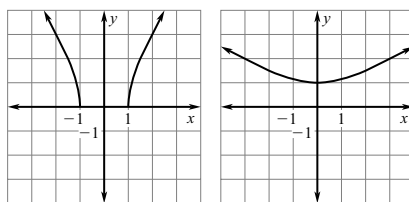


foci: $(\pm\sqrt{181}, 0)$;
asymptotes: $y = \pm \frac{10}{9}x$

43. $y = \pm \frac{6\sqrt{x^2 + 100}}{5}$ 45. $y = \pm \frac{8.5\sqrt{x^2 - 42.25}}{6.5}$

47. $y = \pm \sqrt{\frac{22.3(x^2 - 10.1)}{10.1}}$

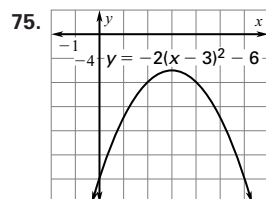
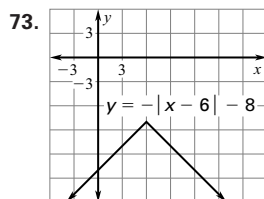
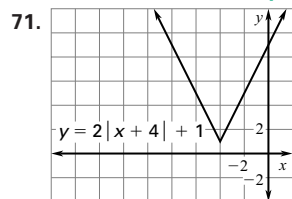
49. Sample answer:



57. $\frac{x^2}{36} - \frac{y^2}{28} = 1$ 59. $\frac{x^2}{25} - \frac{y^2}{11} = 1$ 61. $\frac{y^2}{64} - \frac{x^2}{17} = 1$

63. $\frac{y^2}{16} - \frac{x^2}{134} = 1$ 65. $\frac{y^2}{1024} - \frac{x^2}{3070} = 1$ 67. 10 mi

10.5 MIXED REVIEW (p. 621)

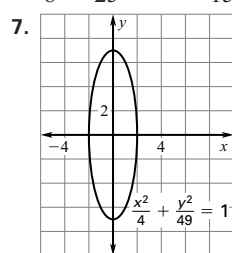


77. $f(x) = x^3 - 6x^2 + 11x - 6$
 79. $f(x) = x^3 - 6x^2 - 4x + 24$
 81. $f(x) = x^3 - 5x^2 + x - 5$
 83. 4 85. 4 87. 3 89. 3
 91. mean: 81.67; median: 81;
 modes: 81, 89; range: 36

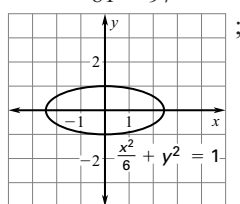
QUIZ 2 (p. 621)

1. $\frac{x^2}{9} + \frac{y^2}{49} = 1$ 2. $\frac{x^2}{36} + y^2 = 1$ 3. $\frac{x^2}{100} + \frac{y^2}{64} = 1$

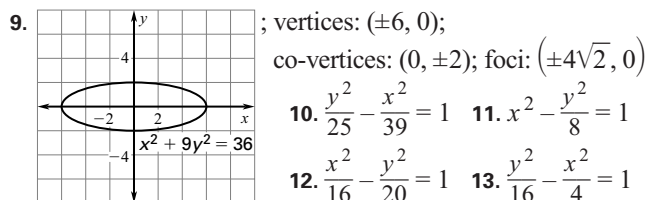
4. $\frac{x^2}{8} + \frac{y^2}{25} = 1$ 5. $\frac{x^2}{15} + \frac{y^2}{12} = 1$ 6. $\frac{x^2}{81} + \frac{y^2}{97} = 1$



vertices: $(0, \pm 7)$;
 co-vertices: $(\pm 2, 0)$;
 foci: $(0, \pm 3\sqrt{5})$

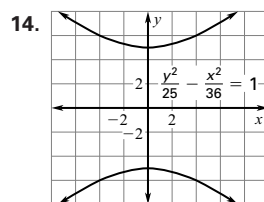


vertices: $(\pm\sqrt{6}, 0)$;
 co-vertices: $(0, \pm 1)$;
 foci: $(\pm\sqrt{5}, 0)$

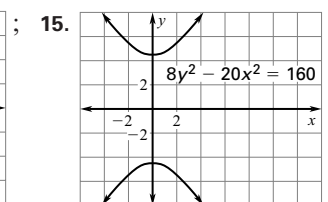


10. $\frac{y^2}{25} - \frac{x^2}{39} = 1$ 11. $x^2 - \frac{y^2}{8} = 1$

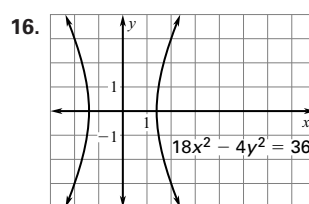
12. $\frac{x^2}{16} - \frac{y^2}{20} = 1$ 13. $\frac{y^2}{16} - \frac{x^2}{4} = 1$



vertices: $(0, \pm 5)$;
 foci: $(0, \pm\sqrt{61})$;
 asymptotes: $y = \pm \frac{5}{6}x$



vertices: $(0, \pm 2\sqrt{5})$;
 foci: $(0, \pm 2\sqrt{7})$;
 asymptotes: $y = \pm \frac{\sqrt{10}}{2}x$



vertices: $(\pm\sqrt{2}, 0)$;
 foci: $(\pm\sqrt{11}, 0)$;
 asymptotes: $y = \pm \frac{3\sqrt{2}}{2}x$

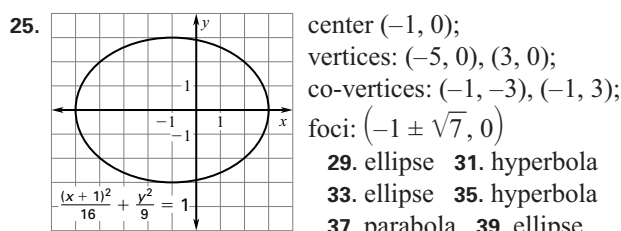
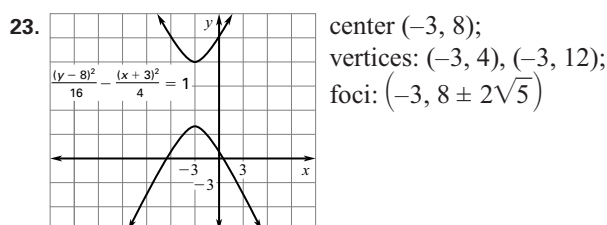
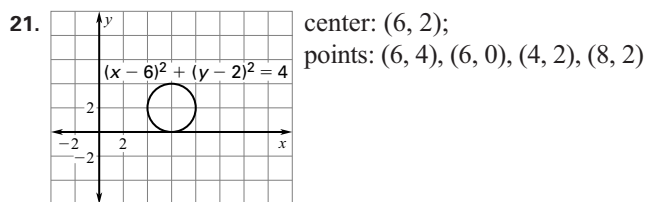
17. $\frac{x^2}{4375^2} + \frac{y^2}{4369^2} = 1$

10.6 PRACTICE (pp. 628–630) 5. $\frac{(x - 3.5)^2}{20.25} + \frac{(y + 4)^2}{18} = 1$

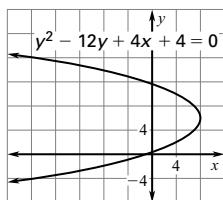
7. $\frac{(y + 2)^2}{4} - \frac{(x - 5)^2}{12} = 1$ 9. hyperbola 11. ellipse

13. $(x - 9)^2 + (y - 3)^2 = 16$ 15. $(x - 1)^2 = 12(y + 2)$

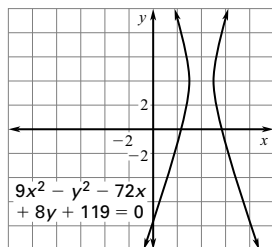
17. $\frac{(x - 2)^2}{18} + \frac{(y - 1.5)^2}{20.25} = 1$ 19. $\frac{y^2}{16} - \frac{(x - 5)^2}{20} = 1$



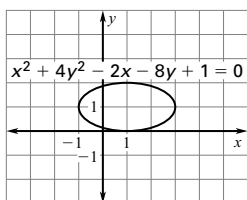
41. circle 43. hyperbola
51. parabola;
 $(y - 6)^2 = -4(x - 8)$;



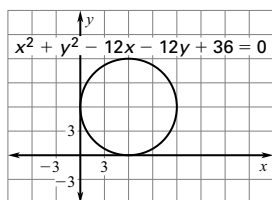
45. E 47. D 49. B
53. hyperbola;
 $(x - 4)^2 - \frac{(y - 4)^2}{9} = 1$;



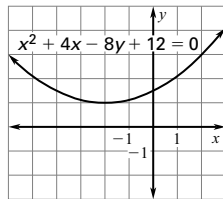
55. ellipse;
 $\frac{(x - 1)^2}{4} + (y - 1)^2 = 1$;



59. circle;
 $(x - 6)^2 + (y - 6)^2 = 36$;



61. parabola;
 $(x + 2)^2 = 8(y - 1)$;



63. $y^2 = 12x$; $y^2 = -12(x - 50)$ (x, y in ft)

65. ellipse
67. The first is elliptical, the second is parabolic.

10.6 MIXED REVIEW (p. 631) 71. (5, -5) 73. (1, -2)

75. $(\frac{68}{23}, \frac{123}{23})$ 77. 5 79. 0 81. 2 83. about 0.45
85. about 4.03 87. about 0.27

10.7 PRACTICE (pp. 635-637) 5. (-1, 0), (-7, 0) 7. (-2, -5), (4, -5) 9. no 11. yes 13. no 15. (1, -4), (2, -1)

17. (3, 6), (-3, -6) 19. (1, -2), (-1, 2) 21. (-1, -2), $(\frac{7}{4}, \frac{3}{4})$

23. $(\frac{6 - \sqrt{6}}{5}, \frac{24 + \sqrt{6}}{10})$, $(\frac{6 + \sqrt{6}}{5}, \frac{24 - \sqrt{6}}{10})$

25. $(2 + \sqrt{6}, \sqrt{6} - 2)$, $(2 - \sqrt{6}, -\sqrt{6} - 2)$

27. (0, 0), (-6, 6) 29. none 31. (0, 2), $(\frac{4}{3}, \frac{2}{3})$

33. $(\pm\sqrt{\frac{5\sqrt{69} - 15}{2}}, \frac{-5 + \sqrt{69}}{2})$

35. $(\frac{1 + \sqrt{373}}{6}, \pm\sqrt{\frac{7 + \sqrt{373}}{18}})$ 37. none 39. none

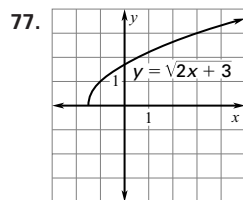
41. $(\frac{9\sqrt{2}}{2}, -\frac{9\sqrt{2}}{2})$, $(-\frac{9\sqrt{2}}{2}, \frac{9\sqrt{2}}{2})$ 43. none 45. (4, 0)

47. (6, -8), (14, -8) 49. (2, 3) 51. $(\pm\sqrt{6}, 2)$, $(\pm\sqrt{3}, -1)$
53. no intersection 55. (5, 7) 59. about 56.9 mi
61. $(4\sqrt{5}, \frac{6\sqrt{5}}{5}) \approx (8.9, 2.7)$ 63. *Sample answer:* The epicenter of the earthquake is about 100 kilometers east and about 1300 kilometers south of Location 1.

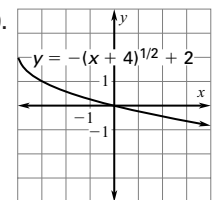
10.7 MIXED REVIEW (p. 638) 67. 13 69. 16

71. $f(x) = x^3 - x^2 - 9x + 9$ 73. $f(x) = x^2 + 4$

75. $f(x) = x^5 - 2x^3 - 2x^2 - 3x - 2$



domain: $x \geq -\frac{3}{2}$;
range: $y \geq 0$



domain: $x \geq -4$;
range: $y \leq 2$

81. ; domain: all reals; range: all reals 83. ellipse 85. parabola

QUIZ 3 (p. 638) 1. $(x + 3)^2 + (y + 5)^2 = 64$

2. $\frac{(x + 0.5)^2}{42.25} + \frac{(y - 2)^2}{22} = 1$ 3. $(y + 1)^2 = 12(x - 4)$

4. $\frac{(y - 3.5)^2}{0.25} - \frac{(x - 2)^2}{20} = 1$ 5. ellipse 6. circle 7. parabola

8. hyperbola 9. $(\frac{2}{3}, \frac{2}{3})$, (-1, 9) 10. (2, 2), (2, 4)

11. (4, -2), (-4, -2) 12. none 13. The epicenter of the earthquake is 50 mi due west of the first seismograph.

CHAPTER 10 EXTENSION (p. 640) 1. 1 3. $\frac{\sqrt{15}}{4} \approx 0.968$

5. $\sqrt{5} \approx 2.236$ 7. $\frac{\sqrt{6}}{2} \approx 1.225$ 9. $\frac{x^2}{25} + \frac{(y + 1)^2}{16} = 1$

11. $\frac{(x - 2)^2}{60} + \frac{y^2}{64} = 1$ 13. $\frac{(y - 1)^2}{(\frac{64}{9})} - \frac{(x - 3)^2}{(\frac{512}{9})} = 1$

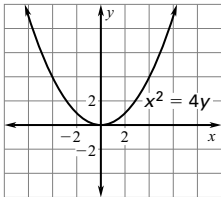
15. $\frac{(y - 2)^2}{9} - \frac{(x - 3)^2}{23.49} = 1$ 17. $\frac{x^2}{1296} + \frac{y^2}{1241} = 1$

(x, y in millions of miles) 19. In an ellipse, the foci are always within the major axis, so $c < a$ and $\frac{c}{a} < 1$. In a hyperbola, the foci are always outside the major axis, so $c > a$ and $\frac{c}{a} > 1$.

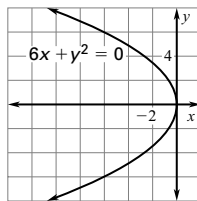
CHAPTER 10 REVIEW (pp. 642–644)

1. $\sqrt{61} \approx 7.81$; $(1, -\frac{1}{2})$ 3. $4\sqrt{2} \approx 5.66$; $(-2, 2)$

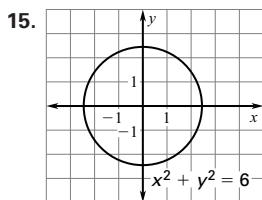
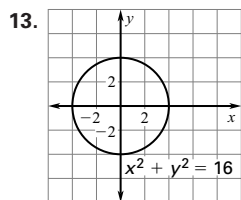
5. focus: $(0, 1)$;
directrix: $y = -1$;



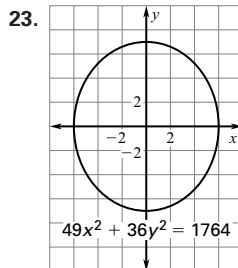
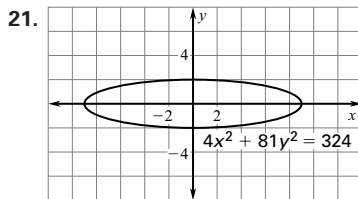
7. focus: $(-\frac{3}{2}, 0)$;
directrix: $x = \frac{3}{2}$;



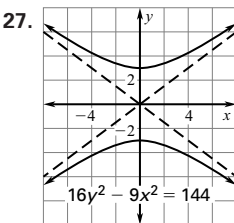
9. $y^2 = 16x$ 11. $x^2 = 8y$



17. $x^2 + y^2 = 25$ 19. $x^2 + y^2 = 13$



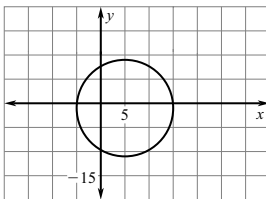
25. $\frac{x^2}{16} + \frac{y^2}{7} = 1$



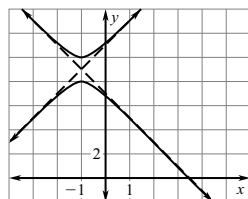
29. $y^2 - \frac{x^2}{8} = 1$

31. $\frac{x^2}{9} - \frac{y^2}{16} = 1$

33. circle; $(x - 5)^2 + (y + 1)^2 = 100$;



35. hyperbola;
 $(y - 9)^2 - \frac{(x + 1)^2}{(\frac{1}{4})} = 1$;



37. $(\frac{-27 - \sqrt{1649}}{10}, \frac{141 + 3\sqrt{1649}}{10})$;

$(\frac{-27 + \sqrt{1649}}{10}, \frac{141 - 3\sqrt{1649}}{10}) \approx (-6.761, 26.28)$;
 $(1.361, 1.918)$ 39. $(-1, -3)$ and $(-1, 3)$

CHAPTER 11

SKILL REVIEW (p. 650) 1. $n + 4$ 2. $3n$ 3. $\frac{n}{2}$ 4. 2 5. $\frac{8}{9}$ 6. 24

7.

| | $f(0)$ | $f(1)$ | $f(2)$ | $f(3)$ | $f(4)$ | $f(5)$ | $f(6)$ |
|-----------------------|--------|--------|--------|--------|--------|--------|--------|
| function values | 3 | 0 | -9 | -24 | -45 | -72 | -105 |
| 1st order differences | -3 | -9 | -15 | -21 | -27 | -33 | |
| 2nd order differences | -6 | -6 | -6 | -6 | -6 | | |

8.

| | $f(1)$ | $f(2)$ | $f(3)$ | $f(4)$ | $f(5)$ | $f(6)$ |
|-----------------------|--------|--------|--------|--------|--------|--------|
| function values | 3 | 16 | 45 | 96 | 175 | 288 |
| 1st order differences | 13 | 29 | 51 | 79 | 113 | |
| 2nd order differences | 16 | 22 | 28 | 34 | | |
| 3rd order differences | 6 | 6 | 6 | | | |

9.

| | $f(1)$ | $f(2)$ | $f(3)$ | $f(4)$ | $f(5)$ | $f(6)$ |
|-----------------------|--------|--------|--------|--------|--------|--------|
| function values | -3 | 7 | 67 | 237 | 601 | 1267 |
| 1st order differences | 10 | 60 | 170 | 364 | 666 | |
| 2nd order differences | 50 | 110 | 194 | 302 | | |
| 3rd order differences | 60 | 84 | 108 | | | |
| 4th order differences | 24 | 24 | | | | |

10. 7 11. 6 12. $\frac{1}{2}$ 13. $-\frac{11}{12}$

11.1 PRACTICE (pp. 655–657) 3. 2, 4, 6, 8, 10, 12 5. 4, 7, 10, 13, 16, 19 7. 68 9. 2, 3, 4, 5, 6, 7 11. 2, 1, 0, -1, -2, -3 13. 4, 9, 16, 25, 36, 49 15. 4, 7, 12, 19, 28, 39

17. $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}$ 19. $\frac{3}{2}, 1, \frac{5}{6}, \frac{3}{4}, \frac{7}{10}, \frac{2}{3}$ 21. $9; 2n - 1$

23. -16; $a_n = 3n - 1$ if n is odd or $2 - 3n$ if n is even.

25. $-\frac{1}{10}; -\frac{1}{2n}$ 27. $2; \frac{n}{3}$ 29. 5.9; $1.1 + 0.8n$

