

## ANSWERS

1.  $\frac{25}{9}$

2. (a)  $\frac{9}{25}$  (b)  $\sqrt{63}$  (c)  $\frac{a}{b^{33/8}}$

3.  $a^{\sqrt{a}}$

4. 6

5. a)  $\frac{2x}{y}\sqrt[3]{2x^2y^2}$  b)  $\frac{2+x-3\sqrt{x}}{4-x}$

6.  $\frac{-2}{(x-2)(a-2)}$

7.  $\frac{3x(2x+3)}{(x+3)(2x-3)}$

8.  $\frac{2(3x+1)}{x}$

9.  $\frac{2x^2+7x+15}{x^2+10x+7}$

10.  $\left\{-\frac{26}{9}\right\}$

11.  $\left\{-\frac{17}{7}\right\}$

12.  $w = \frac{S-2hl}{2l+2h}$

13.  $\left\{\frac{5}{3}, \frac{-3}{2}\right\}$

14.  $\left\{\frac{7 \pm \sqrt{109}}{10}\right\}$

15.  $\{-.59, 2.26\}$

16.  $\left\{ \pm \frac{\sqrt{5}}{5}, \pm \frac{\sqrt{6}}{2} \right\}$

17.  $(-\infty, 3)$

18.  $\left[ \frac{-13}{2}, 6 \right)$

19.  $(-\infty, -6) \cup (4, \infty)$

20.  $(-4, -\frac{7}{3}) \cup [2, 5]$

21.  $(-\infty, -1.11] \cup [.35, 3.43]$

22. a) x- intercepts:  $\pm 2$   
y- intercept: none

b) x-intercept: -3  
y-intercept: -6

23.  $(x + 2)^2 + (y - 5)^2 = 13$

24. (1,4)

25. Graph has y-axis symmetry

26. Graph has x-axis symmetry

27.  $-1/5; -a^2 - 4a; -2x - h - 2$

28. a) -1.8 b) -1.5, 1.7

29. Yes

30. Domain  $(-\infty, -1) \cup (-1, \infty)$

Range  $(-\infty, -3] \cup [0, \infty)$

31.  $[5/2, 7) \cup (7, \infty)$

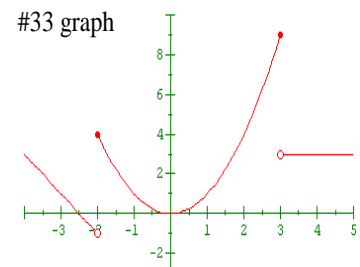
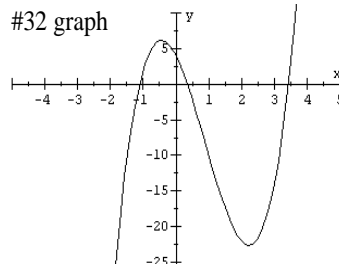
32. Increasing:  $(-\infty, -.45) \cup (2.23, \infty)$

Decreasing:  $(-.45, 2.23)$

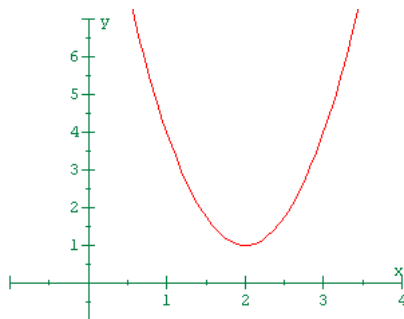
33. Window  $[-4, 5]$  by  $[-5, 10]$

34.  $y = -\frac{5}{8}x - \frac{41}{8}$

35.  $y = -4x + \frac{51}{2}$



36. Vertical stretch factor of 3  
Horizontal shift 2 right  
Vertical shift 1 up

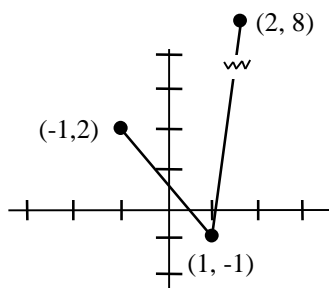


37. a)  $y = 2\left(x - \frac{7}{4}\right)^2 - \frac{25}{8}$ ; Vertex  $\left(\frac{7}{4}, -\frac{25}{8}\right)$  b) Line of symmetry  $x = \frac{7}{4}$  c) Range:  $\left[-\frac{25}{8}, \infty\right)$   
d) Minimum

38.  $f(x) = (x - 2)^2 + 3$

39. a)  $\sqrt{x-1} + x^2 + 2$  b) 54 c)  $\sqrt{26}$  d)  $\sqrt{x^2 + 1}$

40.



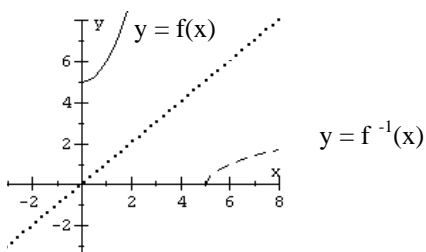
41.  $y = -2(x + 3)^2 - 5$

42. No

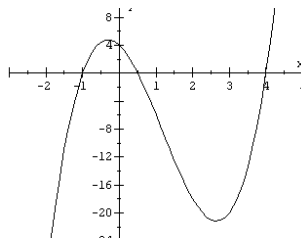
43. Domain:  $[0, \infty)$   
Range:  $[3, \infty)$

44.  $f^{-1}(x) = \frac{5x + 3}{2 - x}$

45.



46. a) See sketch  
 b) Local Max. =  $(-.31, 4.82)$   
 Local Min. =  $(2.65, -21.19)$   
 c) Increasing  $(-\infty, -.31) \cup (2.65, \infty)$   
 Decreasing  $(-.31, 2.65)$



47. Odd

48. Quotient =  $4x^2 + 5x + 15$ ; remainder = 47

49.  $f(-1) = 7 \quad \therefore$  remainder = 7

50.  $Q(x) = x + 2$ ;  $R(x) = 4x + 13$

51. Yes

52.  $k = -\frac{11}{5}$

53.  $f(x) = a(x + 2)(x - 3)(x - 4 - i)(x - 4 + i)$

54.  $f(x) = 2(x - 2)(x - 3) = 2x^2 - 10x + 12$

55.  $-6 + 18i$

56.  $-1 - i$

57.  $\{-7, 1, \pm 2i\}$

58.  $\{-1.44, .41, 1.70\}$

59. a)  $x = -4$ ;  $x = -1$

b)  $y = 0$

c) Domain:  $(-\infty, -4) \cup (-4, -1) \cup (-1, 0) \cup (0, \infty)$

60.  $\left\{\frac{16}{7}\right\}$

61. See sketch at right

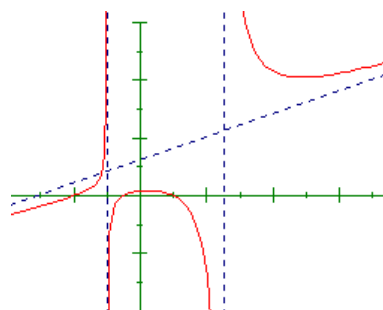
a)  $\{-4, -1, 2\}$

b) y-int =  $\frac{4}{5}$

c) V.A.  $x = -2$ ,  $x = 5$

d) H.A. None

e)  $y = x + 6$



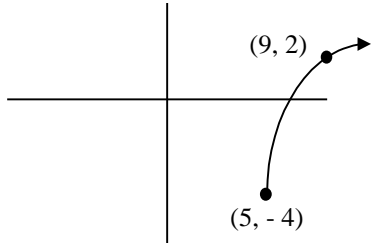
62.  $f(x) = \frac{1}{24}(x-1)(x-3)(x-4)^2$

63.  $(-\infty, -2] \cup [2, \infty); [5, \infty)$

64. 6.5

65.  $\{3\}$

66.

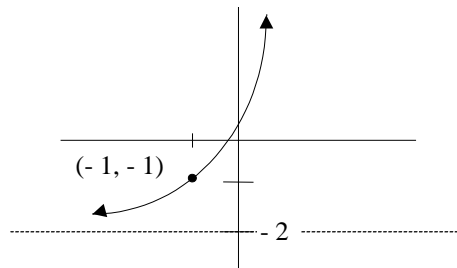


67.

Domain : all reals

Range  $(-2, \infty)$

H. A.  $y = -2$



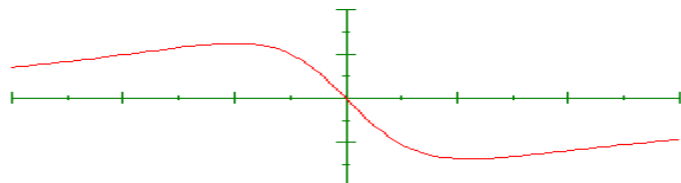
68.  $\left\{-\frac{1}{2}, 2\right\}$

69.

Max.  $(-1.00, .62)$

Min.  $(1.11, -.69)$

$[-3, 3]$  by  $[-1, 1]$

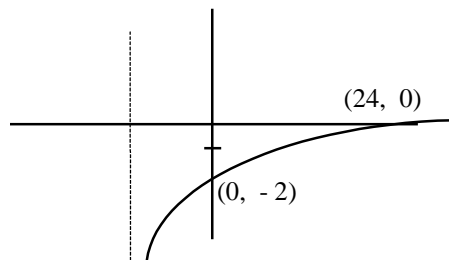


70. a)  $\emptyset$  b)  $\{4\}$  c)  $\{8\}$

71. Domain:  $(-1, \infty)$

Range: all reals

V. A.:  $x = -1$



72.  $\left\{\frac{39}{2}\right\}$

73. a)  $3^P = x$  b)  $\log_3 R = Q$

74.  $\log a + 2\log b - \frac{1}{2}\log 2 - \frac{1}{2}\log c$

75.  $\log_4 \frac{x^5}{\sqrt{3x-4}(5x+1)^3}$
76.  $\frac{\ln 21 - \ln 5 + \ln 4}{2 \ln 4}$ , or equivalent.
77. a) -6.34;      b) 13.22
78. 1.76
79. (a) 3.26      (b) 3.15      (c) -2.58      (d) 1.28
80. (a)  $(0,1) \cup (1,\infty)$       (b)  $(-\infty,6) \cup (17,\infty)$
81. a) 2.5 inches or 7.29 inches      b) 4.70 inches
82. a)  $y = \frac{5}{x}$       b)  $S = 4x + \frac{20}{x} + 5$
83. \$200 or \$175
84. 6.35 feet
85.  $V < 31.23$        $(0, 31.23)$
86. a) 109.77 feet      b) 3.40 sec.
87. 250 yd by 500 yd
88. 13,500
89. 110.02 days
90. 166
91. 8.19%
92. 5.22 years
93. a) none      b) quadratic or exponential
94. b)  $y = 124.27(1.09)^x$       c) 287.2 million
95. 14 min
96. 2.1cm