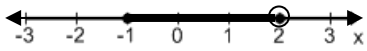
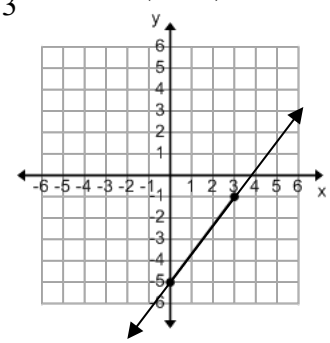
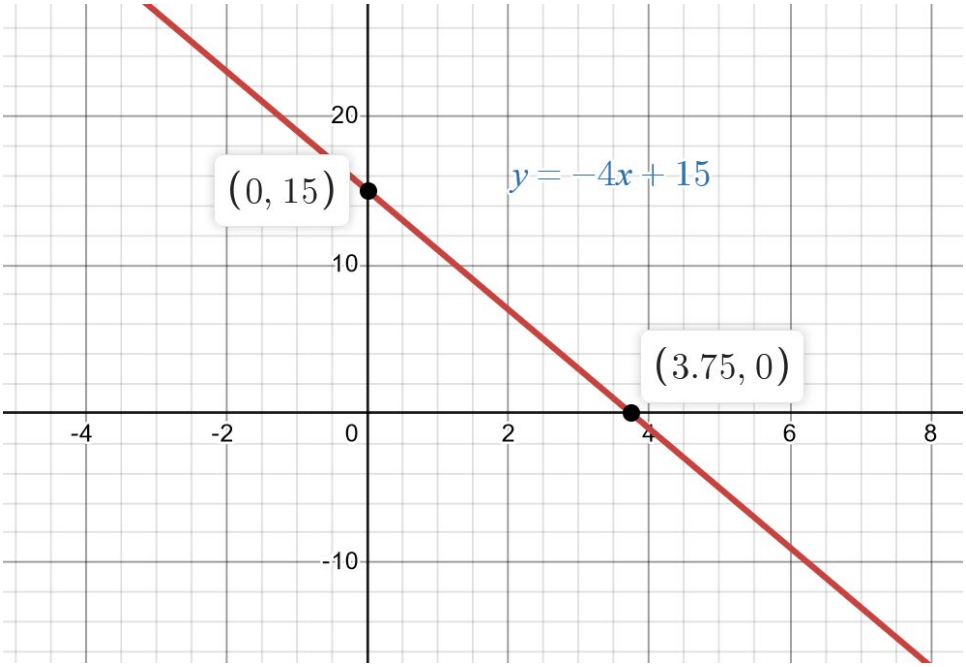
1. $39,\ x^2+12x+11,\ x^2+4x-21$
2. $x=-\frac{3}{2},-1$
3. $m=2,\ -\frac{3}{2}$
4. $b=0,3$
5. $x=2\pm\sqrt{2}$
6. $x=-1,\ 0.5,\ 1$
7. $\{x \mid -1\le x<2\}$, or in interval notation $[-1,2)$



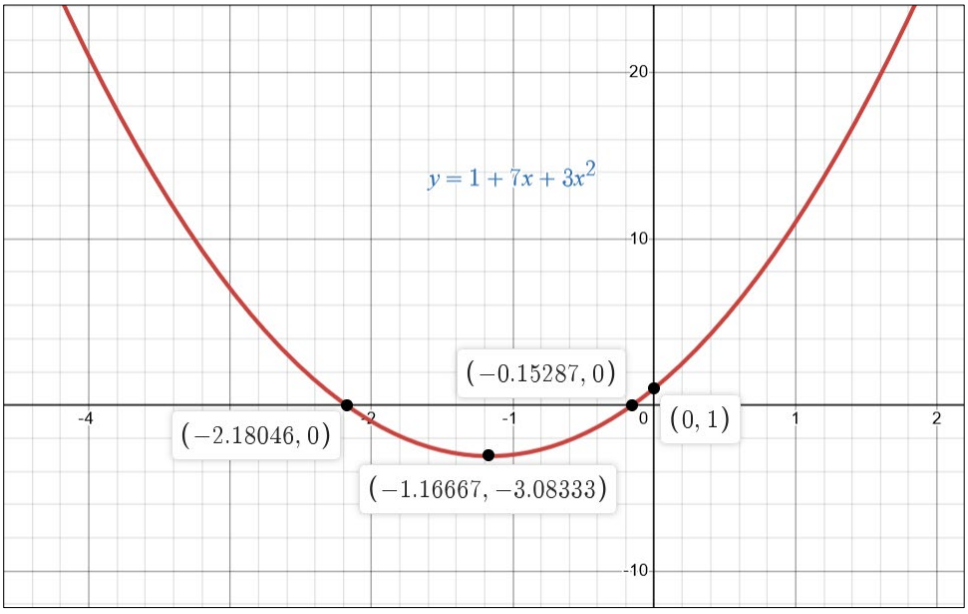
8. Slope $\frac{4}{3}$, $y-int\ (0,-5)$,



9. $y+1=-4(x-4)$ or $y=-4x+15$



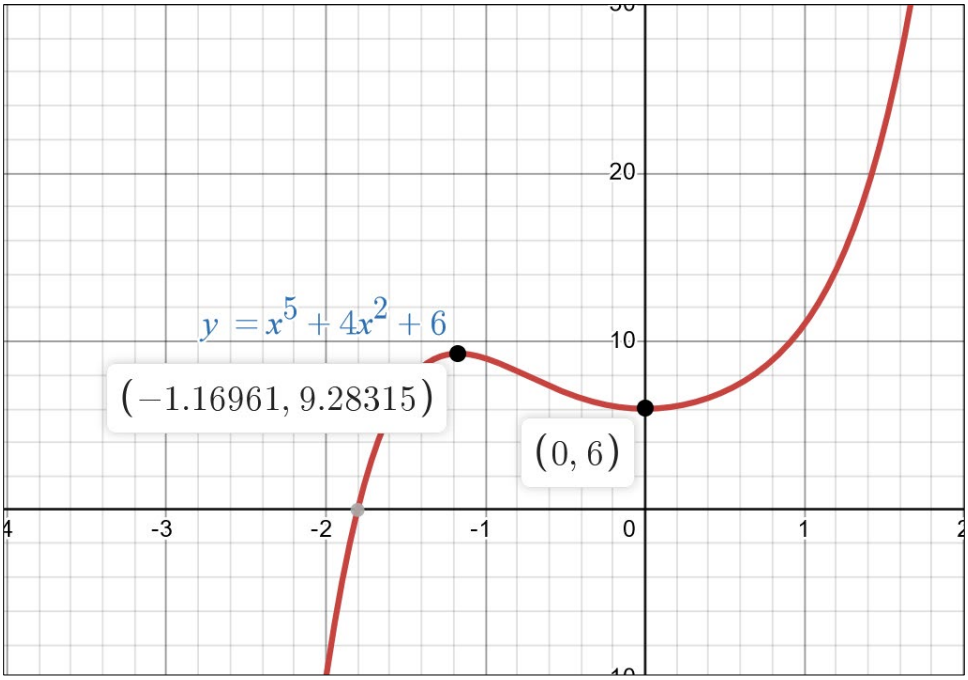
10. $x-intercepts:\ (-2.18,0),\ (-0.15,0)$; minimum $(-1.17,\ -3.08)$



11. $x-int(3,0),\ (-2,0),\ y-int(0,-6)$

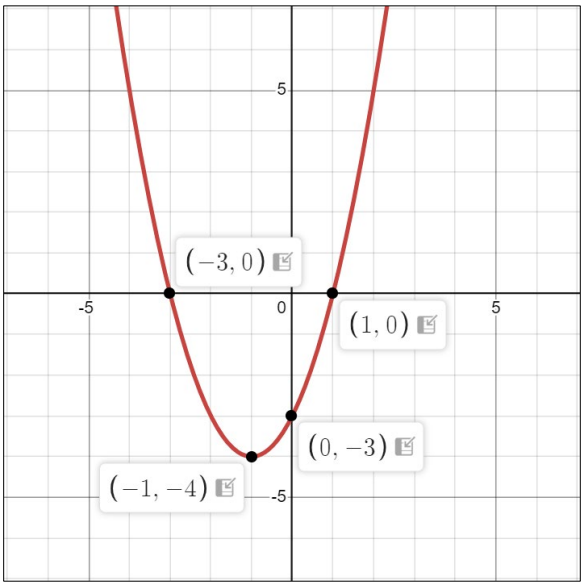
12. $y=-6(x-3)^2+4$

13. Local max of 9.28 *at* $x=\ -1.17$, Local Min of 6 *at* $x=\ 0$.



14. a. opens up, Vertex $(-1,\ -4)$, $y-int\ (0,-3)$; $x-int\ (-3,0)$ and $(1,0)$;
axis of symmetry $x=\ -1$

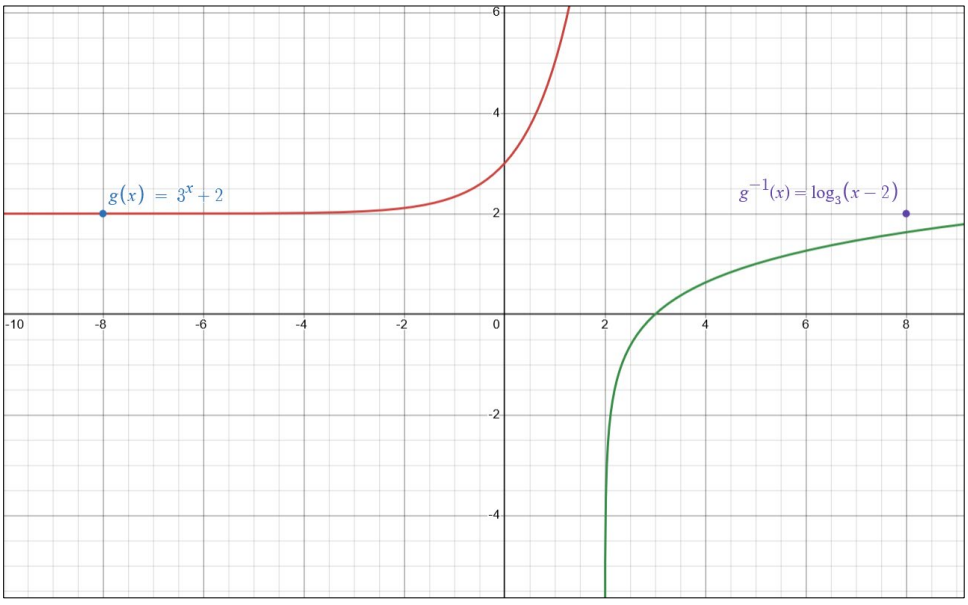
b. $[-3,\ 1]$



15. a. Domain: $\{x \mid x$ is in the set of all real numbers$\}$ OR $(-\infty,\ \infty)$;

Range: $\{x \mid x\ > 2\}$ OR $(2,\infty)$;

Horizontal Asymptote: $y\ = 2$



b. $g^{-1}(x)=\log_3(x-2)$

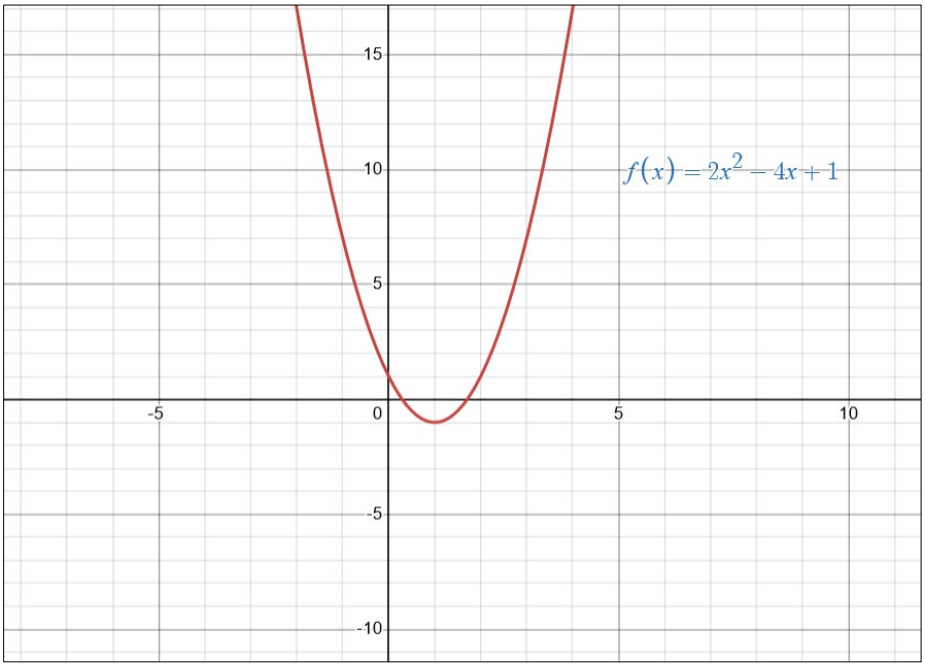
Domain: $\{x \mid x\ > 2\}$ OR $(2,\infty)$

Range: $\{y \mid y$ is in the set of all real numbers$\}$ OR $(-\infty,\ \infty)$;

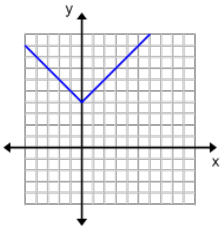
Vertical Asymptote: $x\ = 2$

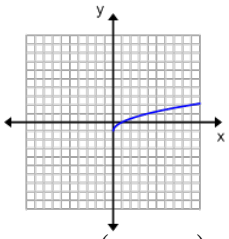
c. See graph above.

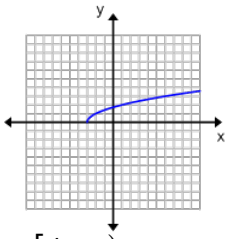
16. opens up, vertex $(1,\ -1)$, axis of symmetry $x\ =1$, $y-int\ (0,\ 1)$, $x-int\ (1.71,\ 0)\ (0.29,\ 0)$

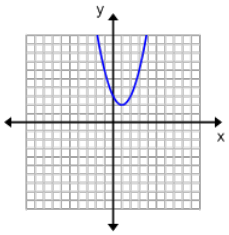


17.

a. 

b. 

c. 

d. 

a. $y-int:\ (0,\ 4)$, Domain: $(-\infty,\ \infty)$, Range: $[4,\ \infty)$

b. $x-int:\ (1,0)$, $y-int:\ (0,\ -1)$, Domain: $[0,\ \infty)$, Range: $[-1,\ \infty)$

c. $x-int:\ (-3,\ 0)$, $y-int:\ (0,\sqrt{3})$, Domain: $[-3,\ \infty)$ [-3, ∞), Range: $[0,\ \infty)$

d $y-int:\ (0,\ 3)$, Domain: $(-\infty,\ \infty)$, Range: $[2,\ \infty)$

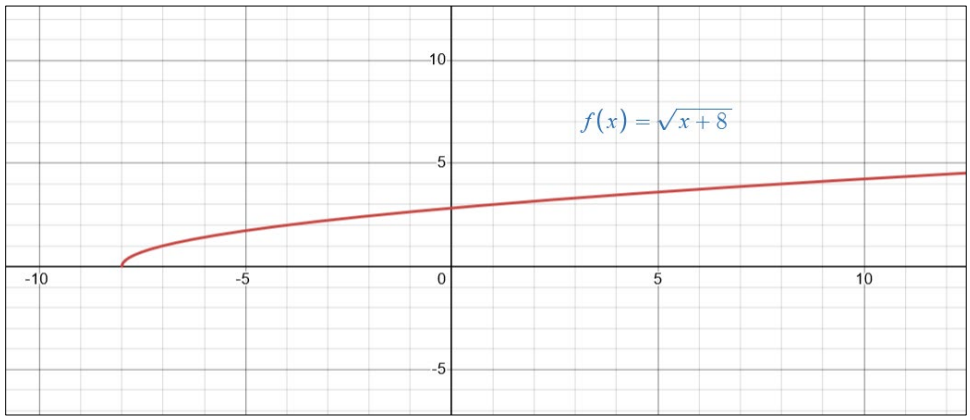
18. NO, it does not pass the vertical line test.

19. a. $h(-2)\ =2,\ h(0)\ =0,\ h(2)=4$

b. D: $[-3,\ 4]$, R: $[0,5]$

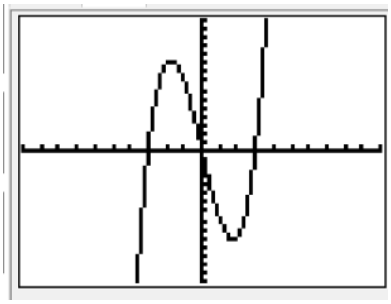
c. $x=-3,\ 2,\ 4$

20. $D:[-8,\infty),\ R:[0,\infty)$



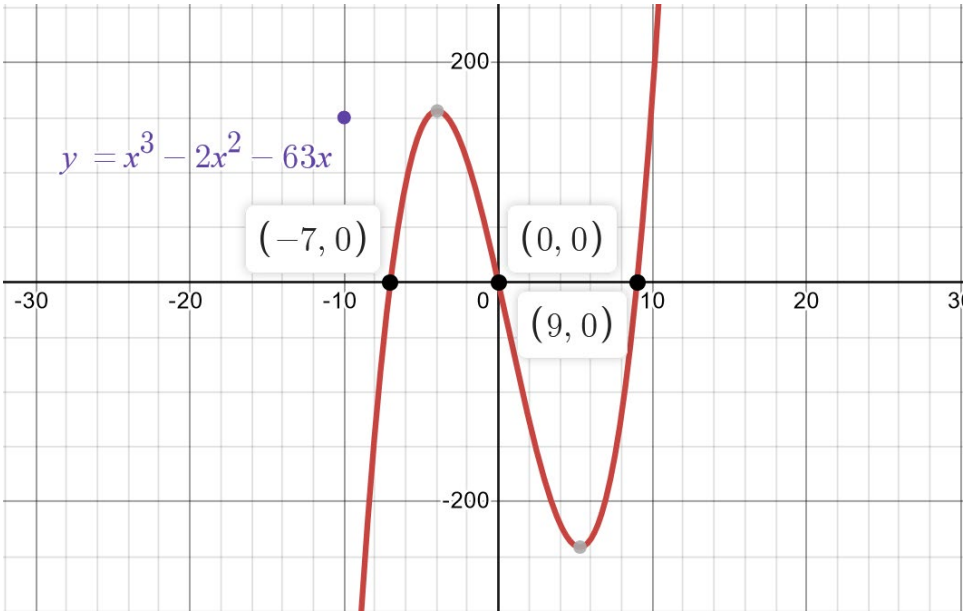
21. a. local max $(-1.73,\ 10.39)$, local min $(1.73,\ -10.39)$

b. f is increasing on $(-\infty,\ -1.73)$ and on $(1.73,\ \infty)$ f is decreasing on $(-1.73,\ 1.73)$

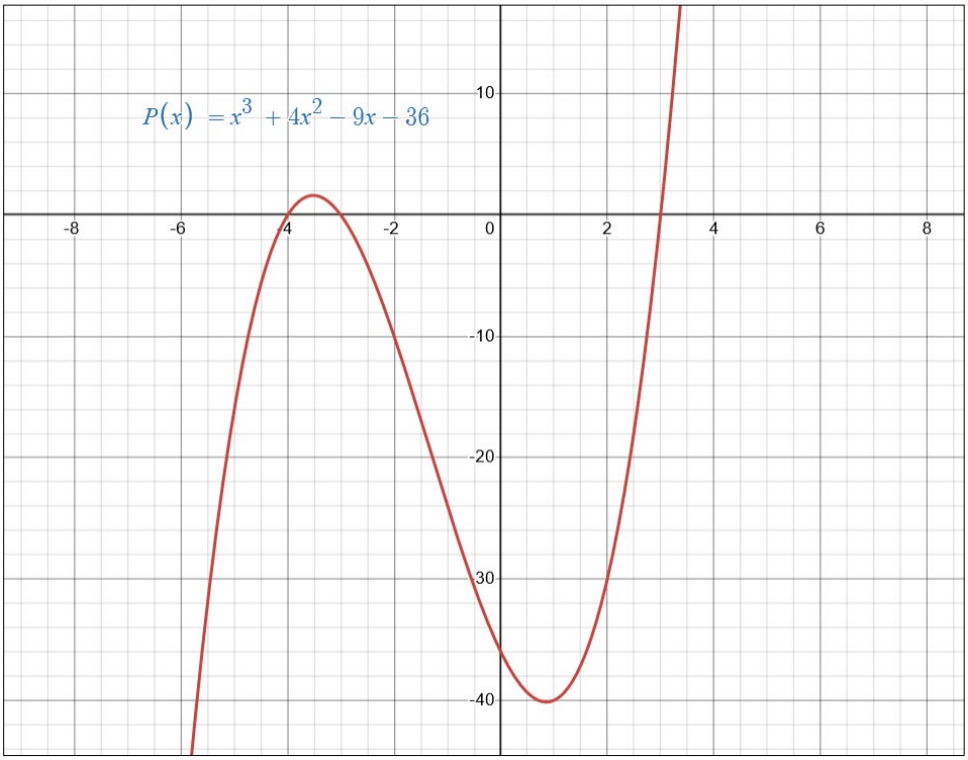


22. local max $(-1.63,\ 8.71)$, local min $(1.63,\ -8.71)$

23. $x=0,-7,9$



24. $x = -4,\ -3,\ 3$



25. $x-int\ (-1,\ 0),\ y-int\ \left(0,\ -\frac{1}{2}\right)$

Domain: $\{x | x \neq 2\}$, Range: $\{y | y \neq 1\}$

26. $x-int\ (-5,\ 0)$ and $(4,\ 0)$ $y-int$ (none)

Domain: $\{x | x \neq 0\}$, Range: $\{y | y \neq 1\}$

27. $x-int\ \left(-\frac{7}{3},\ 0\right)$ $y-int\ (0,\ -3.5)$, vertical asymptote $x = -\frac{2}{7}$

28. $x-int\ (2,\ 0)$ $y-int\ (0,\ 2)$, vertical asymptote $x = 1$ and $x = -3$

29. $x = 1$

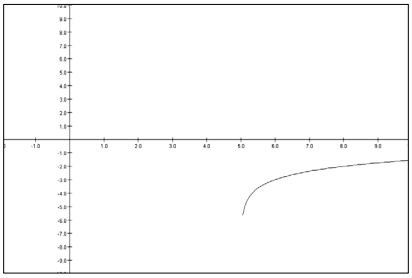
30. a. 8 unit shift to the left.
    b. 8 unit shift up.

31. $g(x) = x^3 - 3$

32. $g(x) = \sqrt[3]{x-3}$

33. $g(x) = 4(x-5)^2 - 3$

34.



35. $T = k \cdot \sqrt[3]{x} \cdot d^2$

36. $y-5=-\frac{2}{3}(x-1),\ 2x+3y=17, y=\frac{-2}{3}x+\frac{17}{3}$

37. $x=-3$

38. $y+3=-1(x-1), x+y=-2, y=-x-2$

39. $y-10=3(x-1), -3x+y=7, y=3x+7$

40. $y+5=-\frac{1}{2}(x-1), x+2y=-9, y=-\frac{1}{2}x-\frac{9}{2}$

41. $\frac{2}{5}$

42. \$50,000 in A Bonds and \$20,000 in CDs.

43. $P=2l+2w$

44. $6\ \frac{2}{3}$ pounds of the \$8 per pound coffee, $26\ \frac{2}{3}$ pounds of the \$5 per pound coffee

45. a. D is $[-5,\ 5]$; R *is* $[-3,\ 3]$

    b. $x-int\ (-2,0)\ (2,0), y-int\ (0,2)$

    c. 3

    d. $x=-5,\ 3$

    e. $[-5,-2)$ and $(2,\ 5]$

46. $x \le \frac{4}{5},\ f(-1)=3$

47. Domain: $\{x \mid x$ is any real number except $-1\}$

48. Domain: $\{x \mid x$ is any real number except 5 and $-6\}$

49. Domain: $\{x \mid x \le -10$ or $x \ge\}$ Domain: $\{x \mid\}$

50. $[0,6]$

51. a. $f(g(x))=\frac{2x+7}{2x+3}$, D:$\left\{x \mid x \text{ is any real number except } -\frac{3}{2}\right\}$

    b. $g(f(-2))=5$

    c. $f(g(-2))=-3$

52. a. $\sqrt{11}$

    b. 1

    c. $\sqrt{\sqrt{6}+2}$

    d. 19

53. $(f+g)(x)=3x^2+4x+1$, D:$(-\infty,\infty)$, R:$\left[\frac{-1}{3},\infty\right)$

$(f-g)(x)=3x^2-2x+1$, D:$(-\infty,\infty)$, R:$\left[\frac{2}{3},\infty\right)$

$(f\cdot g)(x)=9x^3+3x^2+3x$, D:$(-\infty,\infty)$, R:$(-\infty,\infty)$

$\left(\frac{f}{g}\right)(x)=\frac{3x^2+x+1}{3x}$, D:$\{x \mid x$ is any real number except $0\}$, R:$(-\infty,-0.82]\cup[1.49,\infty)$

54. $(f+g)(x)=\frac{4x-9}{x(x-3)}$, D:$(-\infty,0)U(0,3)U(3,\infty)$, R:$(-\infty,\infty)$

$(f-g)(x)=\frac{-2x+9}{x(x-3)}$ D:$\{x \mid x$ is any real number except 0 and $3\}$,

R:$(-\infty,-2.49]U[-.18,\infty)$

$(f\cdot g)(x)=\frac{3}{x(x-3)}$, D:$\{x \mid x$ is any real number except 0 and 3, R:$(-\infty,-1.33]U(0,\infty)$

$\left(\frac{f}{g}\right)(x)=\frac{x}{3(x-3)}$, D:$\{x \mid x$ is any real number except 0 and $3\}$, R:$\left(-\infty,\frac{1}{3}\right)\cup\left(\frac{1}{3},\infty\right)$

55. Domain of f: $\left\{x \mid x \text{ is any real number except } \frac{5}{3}\right\}$

Range of f: $\{y \mid y$ is any real number except $0\}$ $f^{-1}(x)=\frac{2+5x}{3x}$

Domain of inverse: $\{x \mid x$ is any real number except $0\}$

Range of inverse: $\left\{y \mid y \textit{ is any real number except } \frac{5}{3}\right\}$

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

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

58. $f^{-1}(x)=\sqrt[3]{1-x}$

59. Yes, each x has exactly one y and each y has exactly one x.

60. 3 and -1

61. $\frac{4}{5}$

62. $2,-\frac{1}{3}$

63. -7

64. $125^{\frac{1}{3}}=5$

65. 5

66. 1

67. $-\frac{3}{2}$

68. $\log(0.0001) = -4$

69. a. 3
    b. 2
    c. 1

70. 4

71. 625

72. a. π
    b. 40
    c. 90

73. a. 16
    b. -1

74. $-\ln(2)$

75. $\frac{1 \pm \sqrt{13}}{2}$

76. $\frac{-3\ln(7)}{\ln(7)-1} \approx -6.17$

77. $2\sqrt{6}$

78. a. 6 grams
    b. 4.677 grams
    c. 5 days

79. a. \$5,402.28
    b. \$6,711.69
    c. 10 years

80. \$8,374.84

81. a. 49
    b. 64

82. a. $(0, \infty)$
    b. $f^{-1}(x) = 6^x$

83. 3

84. $8\log_a(x) - \log_a(y) - 9\log_a(z)$

85. $\frac{1}{6}\log_7(x-5) - \frac{1}{6}\log_7(x+5)$

86. $x - \log x - \log(x^4+2) - \log(x^6+6)$

87. $\log_3\left(\frac{A^5B^3}{C^5}\right)$

88. $\log\frac{\sqrt[4]{x^2+1}(x-1)}{x^5}$

89. 1.130930

90. $\frac{\log 8}{\log 7}$

91. -6.4895
92. $ln(4)$
93. $9, -9$
94. 109
95. 20
96. 6
97. 9
98. a. 384 million
    b. 299 million
99. a. 46.2 grams
    b. 35.7 days
    c. 25.2 days
100. a. 206 degrees
    b. 150.13 degrees
    c. 27.45 minutes
101. $x = 2,\ y = 1$ or $(2,\ 1)$
102. No Sol'n
103. Infinite Sol'ns $\left(x, \frac{1}{5}x + 4\right)$
104. $(-10,\ 8, -2)$
105. Infinite Solutions $(26 - 3z,\ -11 + 2z,\ z)$ Z is any real number.
106. No sol'n
107. 8,9,10,11 and 107
108. $5, 4, 0, -16, -80$
109. $a_n = 2 \cdot 2^{n-1} = 2^n$
110. $a_n = 2 + 6(n-1) = 6n - 4$
111. 55
112. 8
113. 380
114. $\sum_{k=5}^{14} k^2$
115. $a_n = 6 + 2(n-1) = 2n + 4,\ a_{10} = 24$
116. $d = 4,\ \ a_5 = 19,\ a_n = 3 + 4(n-1)$ OR $a_n = 4n - 1,\ a_{100} = 399$
117. 105
118. 1,410
119. $\frac{2}{3}$