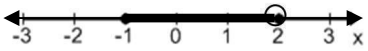
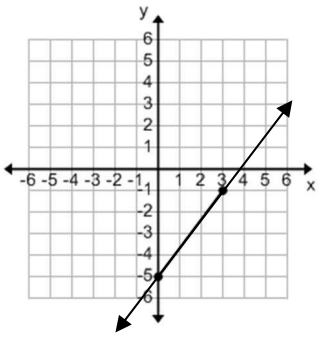
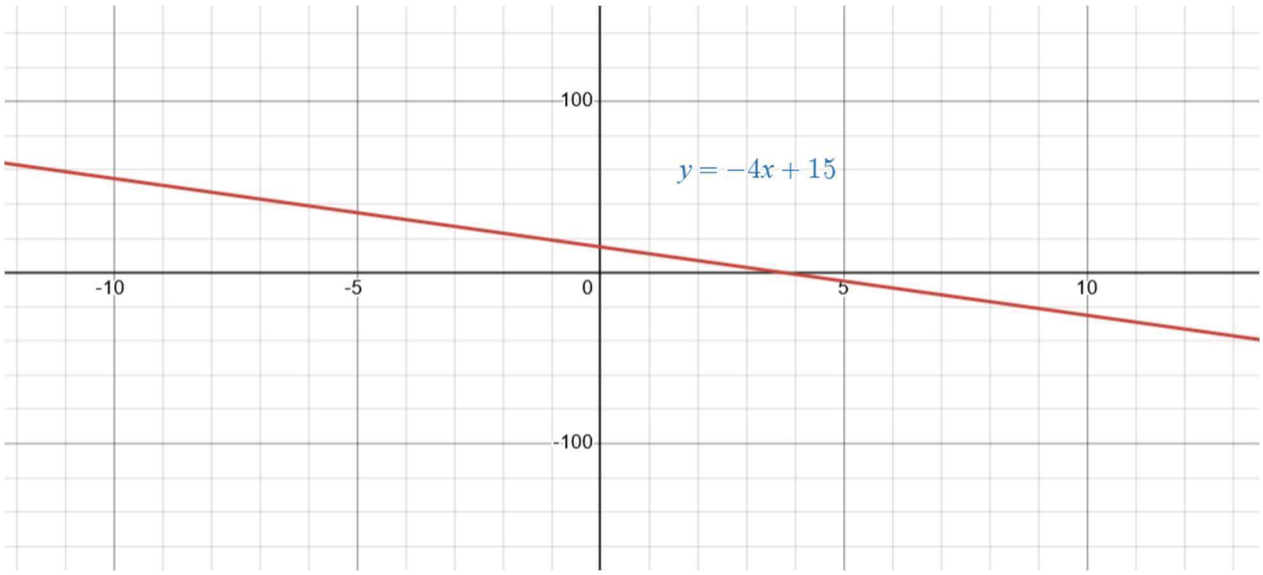
1. $39,\ x^2+12x+11,\ x^2+4x-21$
2. $x=-\frac{3}{2},-1$
3. $m=2,\ -\frac{3}{2}$
4. b=0, 3
5. $x=2\pm\sqrt{2}$
6. x=-1, 0.5, 1
7. {x | 2 > x ≥ -1}, or in interval notation [-1, 2)



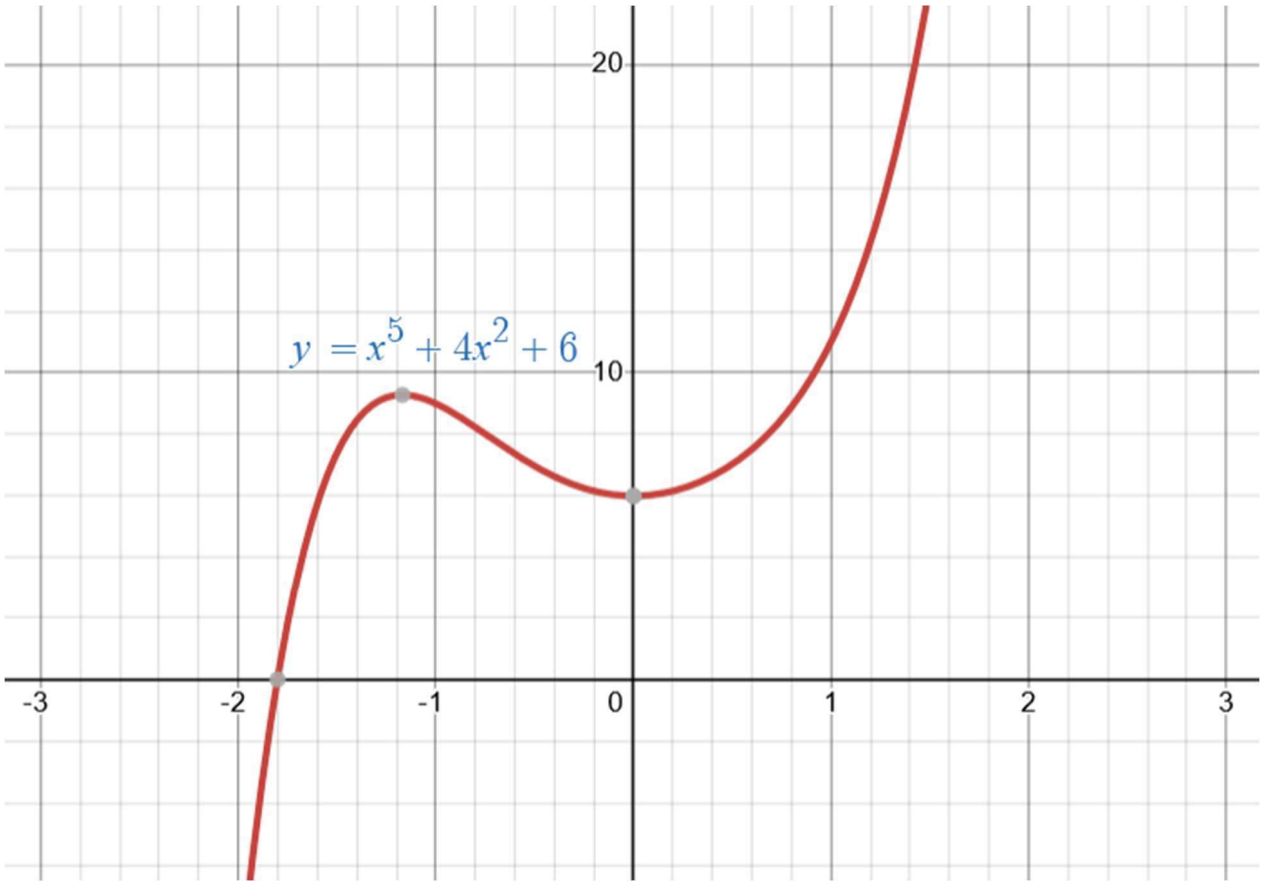
8. Slope $\frac{4}{3}$, y-int (0,-5),



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



10. minimum (-0.5, 0.75)
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.

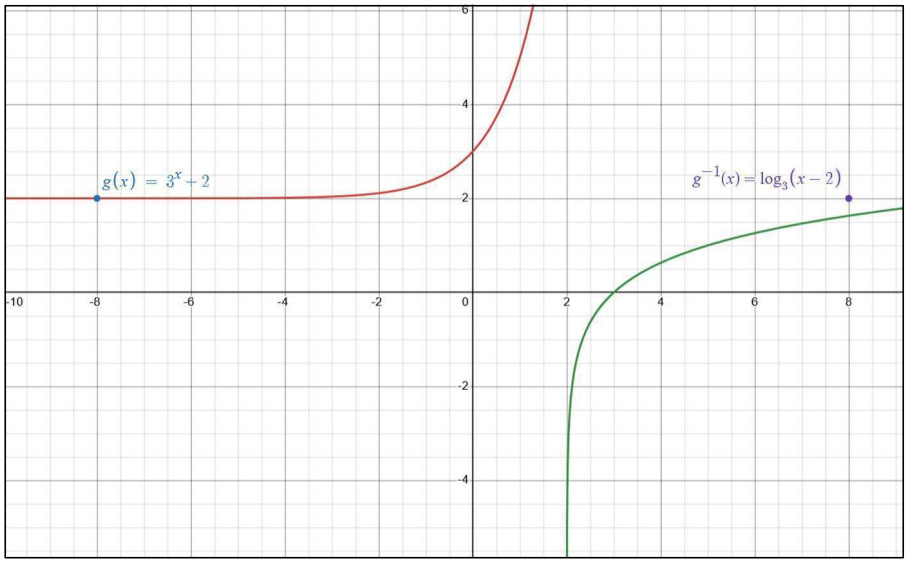


14. a. opens up, Vertex (-1, -4), y-int (0,-3); x-int (-3,0) and (1,0); axis of symmetry x= -1
    b. [-3, 1]

15. a. Domain {xl x is in the set of all real numbers} OR (-∞, ∞);

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

Horizontal Asymptote y =2



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

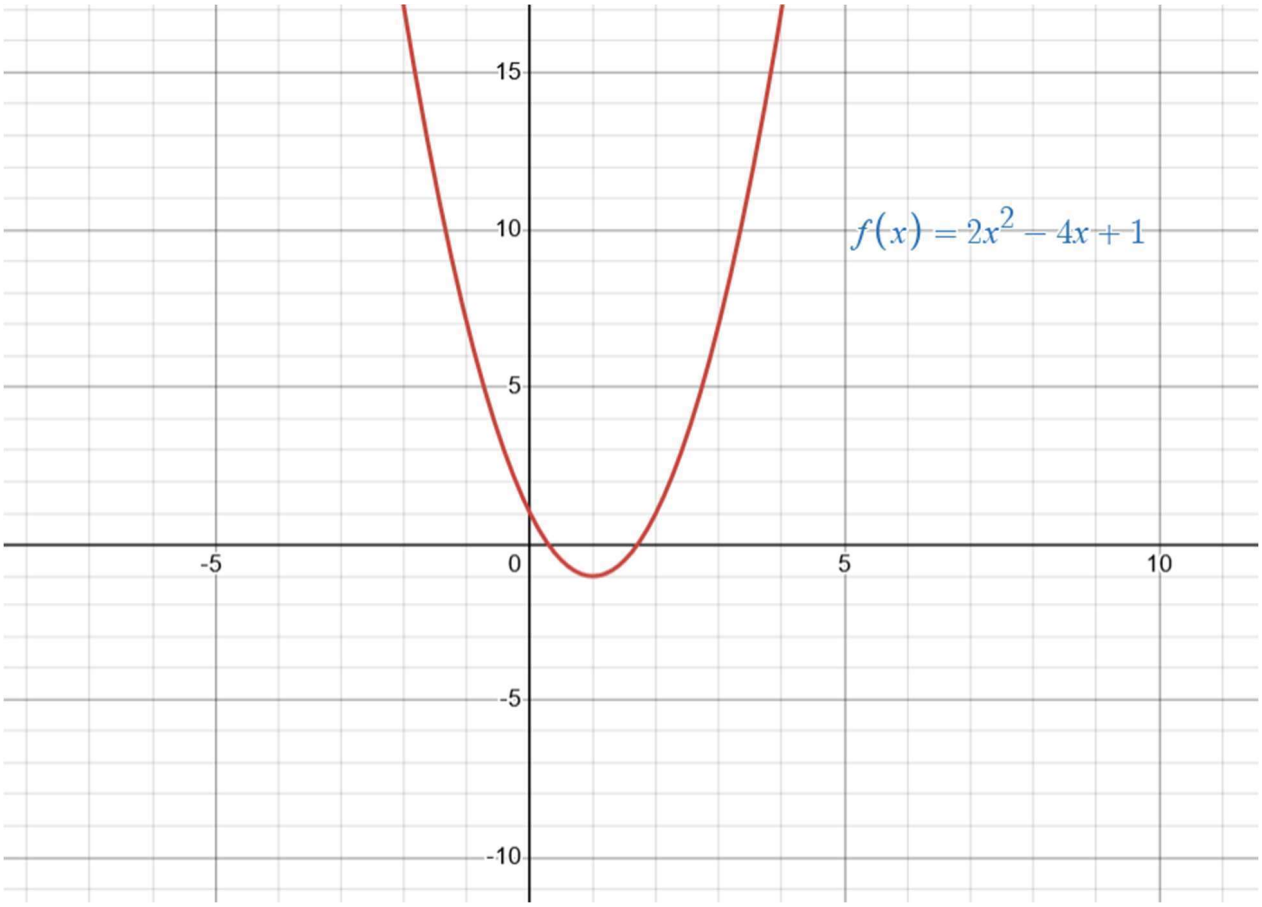
Domain {xl x >2} OR $(2,\infty)$;

Range {yl y is in the set of all real numbers} OR (-∞, ∞);

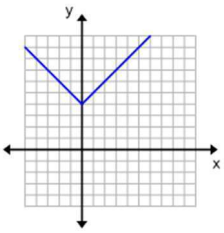
Vertical Asymptote x =2

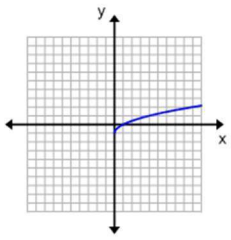
c. See graph above.

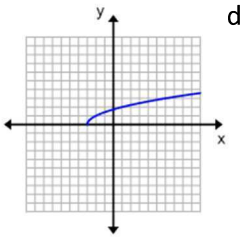
16. opens up, vertex (1, -1), axis of symmetry x =1, y-int (0, 1), x-int (1.71, 0) (0.29, 0)

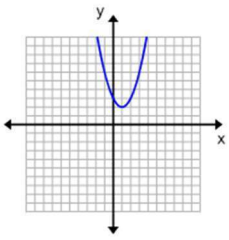


17.

a. 

b. 

c. 

d. 

a. y-int: (0, 4), Domain: (-∞, ∞), Range: [4, ∞)

b. x-int: (1,0), y-int: (0, -1), Domain: [0, ∞), Range: [-1, ∞)

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

d y-int: (0, 3), Domain: (-∞, ∞), Range: [2, ∞)

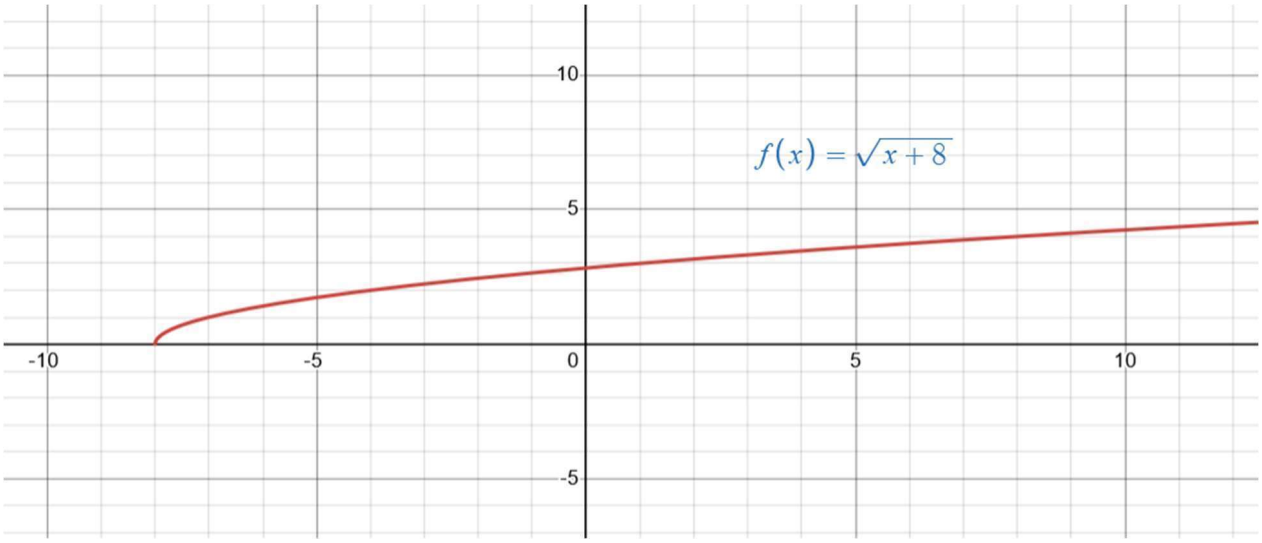
18. NO, it does not pass the vertical line test.

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

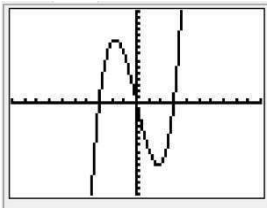
b. D: [-3, 4], R: [0,5]

c. x=-3, 2, 4

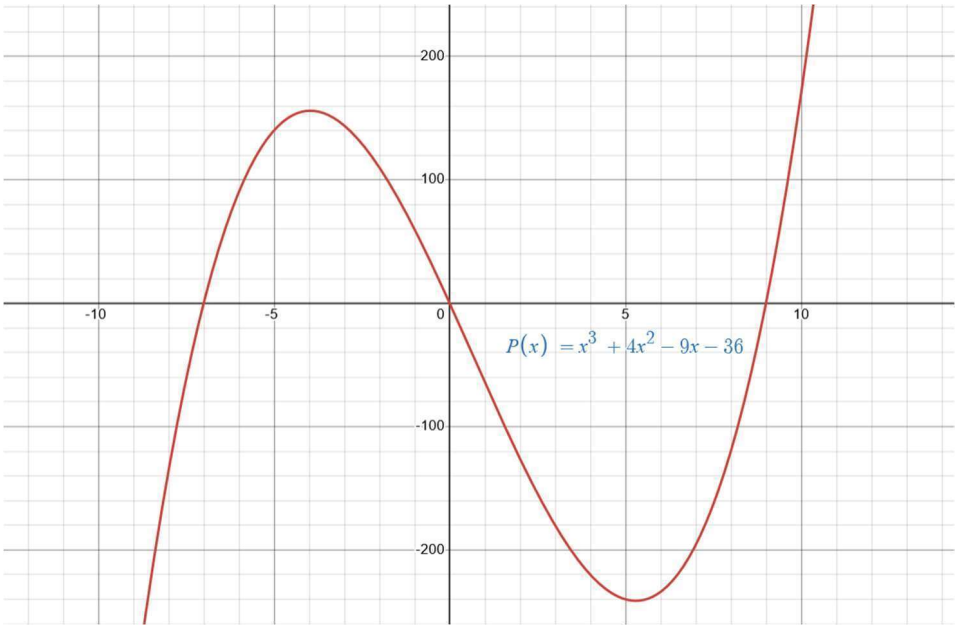
20. D: $[-8, \infty)$, R: $[0, \infty)$



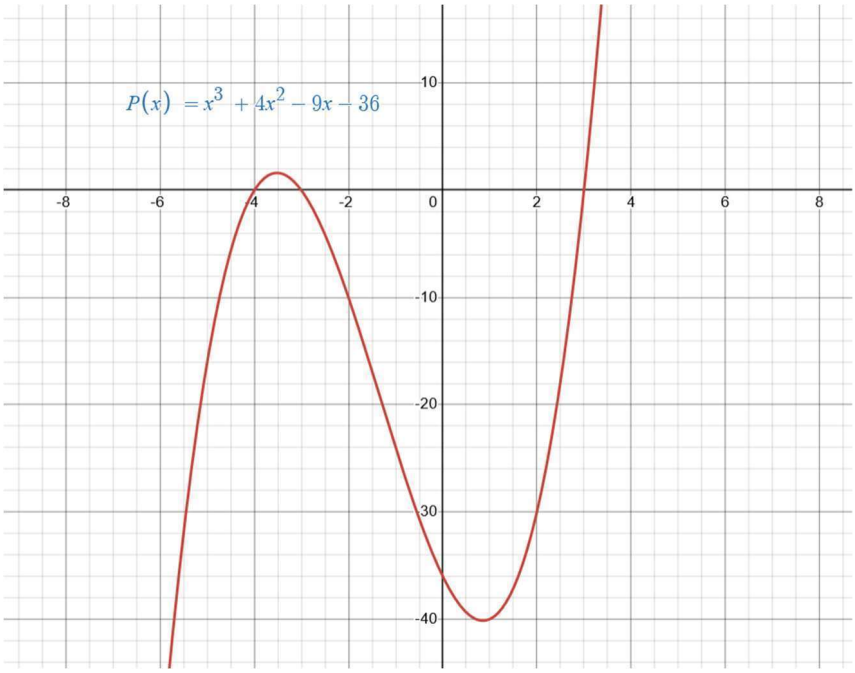
21. a. local max (-1.73, 10.39), local min (1.73, -10.39)
    b. f is increasing on (-∞, -1.73) and on (1.73, ∞) f is decreasing on (-1.73, 1.73)

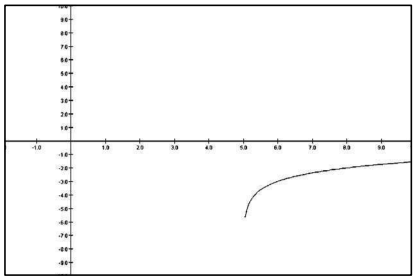


22. local max (-1.63, 8.71), local min (1.63, -8.71)
23. x = 0, -7, 9



24. x=-4, -3, 3



25. x-int (-1, 0), y-int (0, -1/2)
26. x-int (-5, 0) and (4, 0) y-int (none)
27. x-int (-7/3, 0) y-int (0, -3.5), vertical asymptote x=-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. 2/5

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

43. $P=2l+2w$

44. 6 2/3 pounds of the $8 per pound coffee, 26 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. D:{xl x is any real number except -1}

48. D:{xl x is any real number except 5 and -6}

49. D: {xl $x \le -10 \text{ or } x \ge 10$ }

50. $[0,6]$

51. a. $f(g(x))=\frac{2x+7}{2x+3}$, D:{xl x is any real number except -3/2)
    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|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|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|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|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: {x|x is any real number except 5/3} Range of f: {y|y is any real number except 0}

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

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. 4/5

62. 2, -1/3

63. -7

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

65. 5

66. 1

67. -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. \$5402.28
    b. \$6711.69
    c. 10 years
80. \$8374.84
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, 24
116. $d = 4,\ \ a_5 = 19,\ a_n = 3 + 4(n-1)$ OR $a_n = 4n - 1,\ a_{100} = 399$
117. 105
118. 1410
119. 2/3