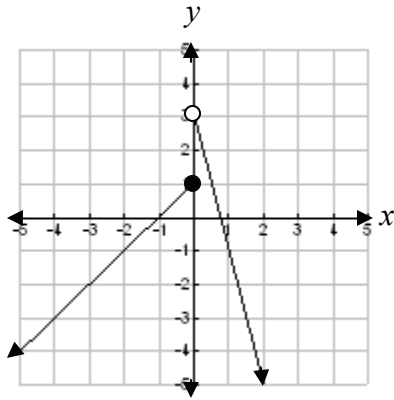


1.



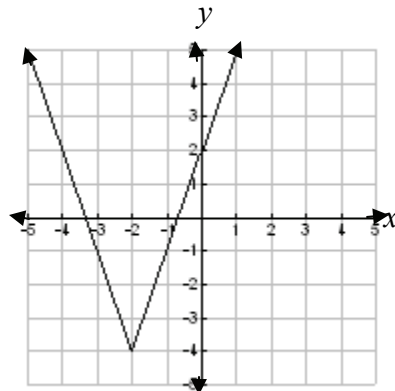
2.
$$f(x) = \begin{cases} -x+3, & \text{if } x < 0 \\ x+1, & \text{if } x \geq 0 \end{cases}$$

3.
$$f(x) = \begin{cases} x+2, & \text{if } x < 1 \\ [x], & \text{if } x \geq 1 \end{cases}$$

4. a.
$$f(x) = \begin{cases} 12+5x, & \text{if } 0 < x \leq 5 \\ 12+4.50x, & \text{if } 6 \leq x \leq 9 \text{ or } 5 < x < 10 \\ 12+3x, & \text{if } x \geq 10 \end{cases}$$

b. 13 items

5. a.



b. all real numbers

- c. $y \geq -4$
- d. $(-2, -4)$
- e. The line $x = -2$
- f. -4
- g. yes
6. -5
7. 98
8. $3x - 11$
9. $-x + 5$
10. $(x - 3)(2x - 8) = 2x^2 - 14x + 24$
11. a. $\frac{x - 3}{2x - 8}$; b. all real numbers except 4 or $x \neq 4$
12. $2(x^2 - 2) - 8 = 2x^2 - 12$
13. $(x - 3)^2 - 2 = x^2 - 6x + 7$
14. a. $x \geq -2$
b. $x \geq -8$
15. 1 to 1
16. not 1 to 1
17. not 1 to 1
18. not 1 to 1

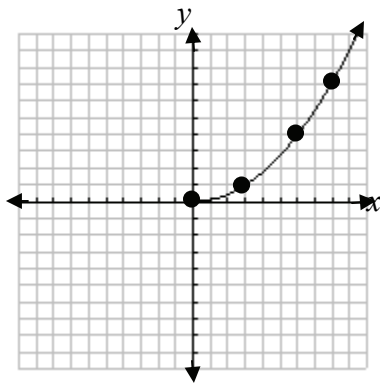
19. yes $f(g(x)) = 7\left(\frac{x+6}{7}\right) - 6 = x + 6 - 6 = x$

$$g(f(x)) = \frac{(7x-6)+6}{7} = \frac{7x}{7} = x$$

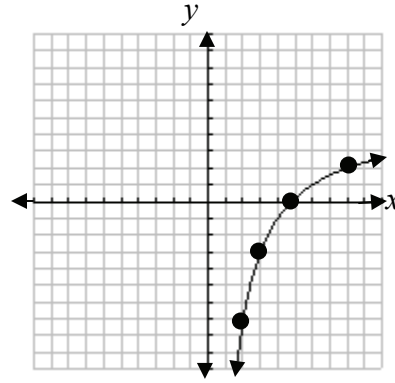
20. **D**

21. $g^{-1}(x) = \frac{x+10}{9}$

22.



23.



24. Answers may vary. Most common is $x \geq -3$.

25. Translate two units to the left and up 1 unit

26. Stretch vertically by a factor of 5, translate 1 unit to the right, and 9 units down.

27. **A**

28. 3×7

29. 14

30. 7

31. 4.5

32. **C**

33. Let x = the cost of one hamburger
 Let y = the cost of one cheeseburger
 Let z = the cost of one BarryBurger

a.

$$3x + 5y + 6z = 25.24$$

$$2x + 7y + 5z = 25.68$$

$$4x + 4y + 7z = 26.59$$

b.

$$\begin{bmatrix} 3 & 5 & 6 \\ 2 & 7 & 5 \\ 4 & 4 & 7 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 25.24 \\ 25.68 \\ 26.59 \end{bmatrix}$$

- c. One hamburger costs \$0.85, one cheeseburger costs \$1.79, and one Barry Burger Costs \$2.29.

34.

1	.	2	1
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	0	0	0
<input type="radio"/>	1	1	<input checked="" type="radio"/>
2	2	<input checked="" type="radio"/>	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

35. $A: -4$ $B: 4i$ $C: 5 + 2i$ $D: 4 - 3i$ $E: -2 - i$

36. a. real and complex b. pure imaginary and complex c. complex

37. $8 - 5i$

38. $-1 - 11i$

39. 68

40. $-45 - 28i$

54. $y = (x+2)(x-3)(x-6)$

55. $y = -x(x+5)(x-4)$

56. $(x-5)(x^2 + 5x + 25)$

57. $(x+4)(x^2 - 4x + 16)$

58. $x = \frac{2}{5}, \frac{-1 \pm i\sqrt{3}}{5}$

59. $x = -\frac{3}{4}, \frac{3 \pm 3i\sqrt{3}}{8}$

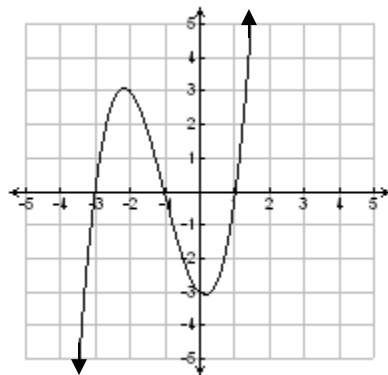
60. $f(x) = (x-3)(x+9i)(x-9i)$

61. $f(x) = (x-8)(x+7i)(x-7i)(x+5i)(x-5i)$

62. a. yes
 b. no
 c. no
 d. no
 e. yes
 f. yes

63. $2x^2 + x - 3$

64. a. zeros are
- $-3, -1, 1$



b. $f(x) \rightarrow \infty$

c. $f(x) \rightarrow -\infty$

65. a. yes
 b. yes
 c. yes
 d. no
 e. no
66. $\pm 1, \pm 2, \pm 4, \pm \frac{1}{5}, \pm \frac{2}{5}, \pm \frac{4}{5}$
67. 0, 2, or 4 imaginary roots
68. a. 4
 b. 2
69. a. **D**
 b. **B**
70. $(-\infty, -4] \cup [-1, 3] \cup [7, \infty)$
71. $(-\infty, -3) \cup (1, 5)$
72. a. $(x+6)(x+1)(x-8)$
 b. $(-\infty, -6] \cup [-1, 8]$
73. a. $(x+4)(x-3)(x-7)$
 b. $[-4, 3] \cup [7, \infty)$
74. $-2 < x < 0, x > 6$
75. Note: Answers are rounded to 3 decimal places

Function	Value of any local maximums	Value of any local minimums	Interval(s) where the function is increasing	Interval(s) where the function is decreasing
$f(x) = \frac{x^3}{3} + 2x^2 + x + 3$	9.797	2.869	$x < -3.732$ $x > -.268$	$-3.732 < x < -.268$
$g(x) = x^4 - 5x^2 + 4$	4	-2.25	$-1.581 < x < 0$ $x > 1.581$	$x < -1.581$ $0 < x < 1.581$

76. a. $f(t) = -16t^2 + 50t + 400$

b. 344 feet

c. 6.801 sec.

77. a. degree 3;

b. $y = x^3 + x^2 - x + 4$

78. degree 2; $y = x^2 + 2x + 3$