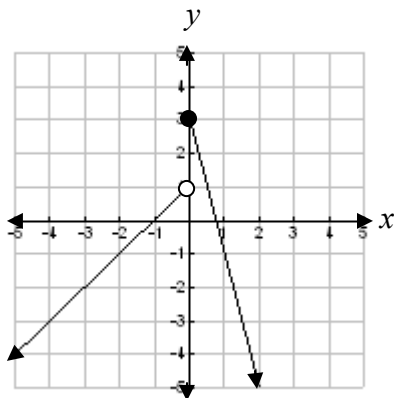
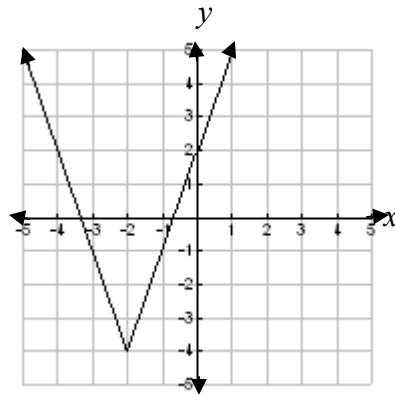


1.  $-5$
2.  $98$
3.  $3x - 11$
4.  $-x + 5$
5.  $(x - 3)(2x - 8) = 2x^2 - 14x + 24$
6.  $\frac{x - 3}{2x - 8}$ ; all real numbers except 4.
7.  $2(x^2 - 2) - 8 = 2x^2 - 12$
8.  $(x - 3)^2 - 2 = x^2 - 6x + 7$
9.
  - a.  $x \geq -2$
  - b.  $x \geq -8$
10. 1 to 1
11. not 1 to 1
12. not 1 to 1
13. not 1 to 1
- 14.



15. a.



- b. all real numbers
- c.  $y \geq -4$
- d.  $(-2, -4)$
- e. The line  $x = -2$
- f.  $-4$

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

b. 13 items

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

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

18. a. Translate two units to the left and up 1 unit

b. Stretch vertically by a factor of 5, translate 1 unit to the right, translate 9 units up.

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

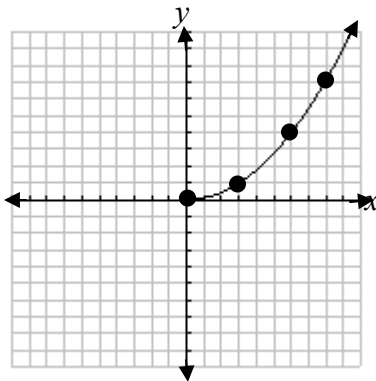
$$g(f(x)) = \frac{(7x-6)+6}{7} = \frac{7x}{7} = x$$

20. **D**

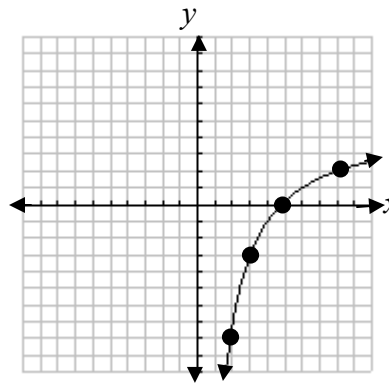
21.  $g^{-1}(x) = \frac{x+10}{9}$

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

23. a.



b.



24. **A**

25.  $3 \times 7$

26.  $60 - 10x$

27. **C**

28. 14

29. 7

30.  $x > 0$  or  $x \geq 0$

31. As  $x \rightarrow \infty, f(x) \rightarrow \infty$       As  $x \rightarrow -\infty, f(x) \rightarrow -\infty$

32. As  $x \rightarrow \infty, f(x) \rightarrow -\infty$       As  $x \rightarrow -\infty, f(x) \rightarrow -\infty$

33. a. **D**  
 b. **B**
34. a. 4  
 b. 2
35. a. degree 3;  
 b.  $y = x^3 + x^2 - x + 4$

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

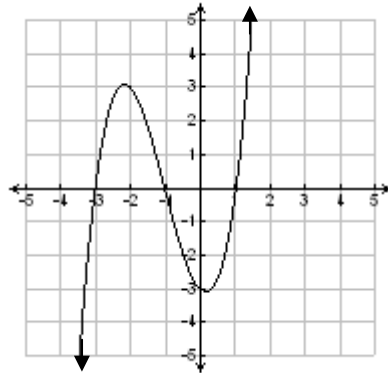
37.  $x = \frac{3 \pm i\sqrt{35}}{2}$

38.  $x = \frac{-1 \pm i\sqrt{35}}{6}$

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

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

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



- b.  $f(x) \rightarrow \infty$
- c.  $f(x) \rightarrow -\infty$
41. a. yes  
 b. yes  
 c. yes  
 d. no  
 e. no

42.  $\pm 1, 2, 4, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$

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

44.  $2x^2 + x - 3$

45. a. 9  
b. 25

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

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

48.  $8 - 5i$

49.  $-1 - 11i$

50.  $18 + 4i$

51.  $-45 - 28i$

52.  $\frac{-7 + 14i}{5}$

53.  $\frac{44 - 5i}{37}$

54.  $\sqrt{13}$

55. 13

56. a.  $(x + 6)(x + 1)(x - 8)$

b.  $(-\infty, -6] \cup [-1, 8]$

57. a.  $(x + 4)(x - 3)(x - 7)$

b.  $[-4, 3] \cup [7, \infty)$

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

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

60. Let  $x$  = the cost of one hamburger  
Let  $y$  = the cost of one cheeseburger  
Let  $z$  = the cost of one Barry Burger

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.

61. a.  $(x-5)(x^2 + 5x + 25)$

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

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

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

63.  $(-\infty, -4] \cup [-1, 3] \cup [7, \infty)$

64.  $(-\infty, -3) \cup (1, 5)$

65. 65a

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

65b

			<b>80</b>
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1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
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9	9	9	9

65c

			<b>81</b>
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2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	<input checked="" type="checkbox"/>	8
9	9	9	9

66.

<b>1</b>	<b>.</b>	<b>2</b>	<b>1</b>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	0	0	<input checked="" type="checkbox"/>
1	1	1	1
2	2	<input checked="" type="checkbox"/>	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

67. 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	$-1.581 < x < 0$ $x > 1.581$	$x < -1.581$ $0 < x < 1.581$

68. a.  $f(t) = -16t^2 + 50t + 400$   
 b. 344 feet  
 c. 6.801 sec.