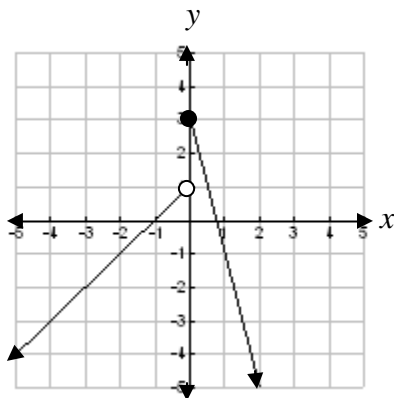
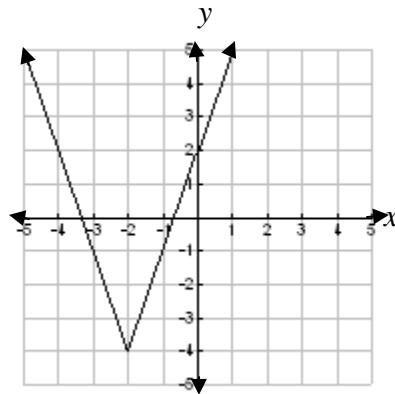


1. -5
2. 98
3. $3x - 11$
4. $-x + 5$
5. $(x - 3)(2x - 8) = 2x^2 - 14x + 24$
6. $\frac{x - 3}{2x - 8}$; all real numbers except 4.
7. $2(x^2 - 2) - 8 = 2x^2 - 12$
8. $(x - 3)^2 - 2 = x^2 - 6x + 7$
9.
 - a. $x \geq -2$
 - b. $x \geq -8$
10. 1 to 1
11. not 1 to 1
12. not 1 to 1
13. not 1 to 1
- 14.



15. a.



b. all real numbers

c. $y \geq -4$

d. $(-2, -4)$

e. The line $x = -2$

f. -4

g. yes

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

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, and 9 units down.

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

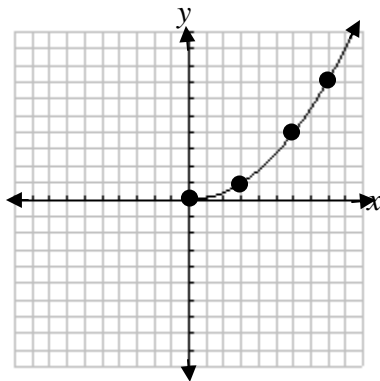
$$g(f(x)) = \frac{(7x-6)+6}{7} = \frac{7x}{7} = x$$

20. **D**

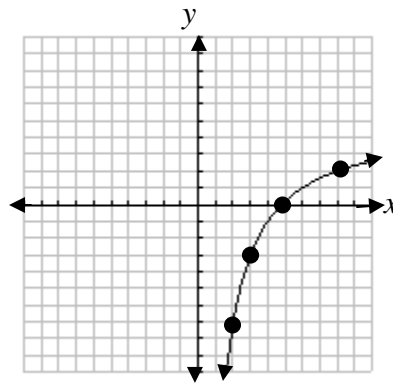
21. $g^{-1}(x) = \frac{x+10}{9}$

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

23. a.



b.



24. **A**

25. 3×7

26. 4.5

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; $y = x^2 + 2x + 3$

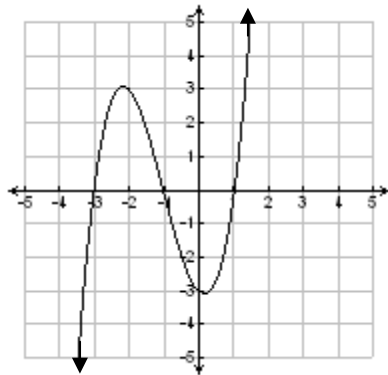
37. $x = \frac{3 \pm i\sqrt{35}}{2}$

38. $x = \frac{-1 \pm i\sqrt{26}}{6}$

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

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

48. $8 - 5i$

49. $-1 - 11i$

50. 68

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

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

65b

			80
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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
⑧	⑧	●	⑧
⑨	⑨	⑨	⑨

65c

			81
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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
⑧	⑧	●	⑧
⑨	⑨	⑨	⑨

66.

1	.	2	1
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	●	<input type="radio"/>	<input type="radio"/>
●	①	①	●
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	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.

69. If the discriminant is positive there are two real roots. If the discriminant is negative there are two complex roots. If the discriminant is zero, there is one (double) root.
70. 0, 2, or 4 imaginary roots
71. $-2 < x < 0, x > 6$