Section 3.6 Answers

#1 – 56: let $f(x) = x^2$ $g(x) = \sqrt{x}$ $h(x) = |x|$ $k(x) = \sqrt[3]{x}$ $m(x) = x^3$

a) find the requested function

b) describe the transformation from the original function.

1a) h(x + 2) = $|x + 2|$ 1b) shifts left 2

3a) h(x + 5) = $|x + 5|$ 3b) shifts left 5

5a) f(x + 3) = (x + 3)²   5b) shifts left 3

7a) f(x + 6) = (x + 6)²   7b) shifts left 6

9a) h(x - 2) = $|x - 2|$ 9b) shifts right 2

11a) h(x - 5) = $|x - 5|$ 11b) shifts right 5

13a) g(x - 3) = $\sqrt{x - 3}$ 13b) shifts right 3

15a) g(x – 4) = $\sqrt{x - 4}$ 15b) shifts right 4

17a) f(x) + 2 = x² + 2   17b) shifts up 2

19a) g(x) + 5 = $\sqrt{x} + 5$ 19b) shifts up 5

21a) h(x) – 3 = $|x| - 3$ 21b) shifts down 3

23a) k(x) – 6 = $\sqrt[3]{x} - 6$ 23b) shifts down 6

25a) h(x + 2) + 1 = $|x + 2| + 1$ 25b) shifts left 2, up 1

27a) h(x + 5) - 1 = $|x + 5| - 1$ 27b) shifts left 5, down 1

29a) g(x - 2) + 1 = $\sqrt{x - 2} + 1$ 29b) shifts right 2 up 1

31a) g(x - 5) - 1 = $\sqrt{x - 5} - 1$ 31b) shifts right 5 down 1

33a) -k(x) = $-\sqrt[3]{x}$ 33b) reflects over x-axis

35a) -h(x) = $-|x|$ 35b) reflects over x-axix

37a) k(-x) = $\sqrt[3]{-x}$ 37b) reflects over y-axis

39a) h(-x) = $|-x| or\ just\ |x|$ 39b) reflects over y-axis

41a) -f(x + 2) +1 = - (x + 2)² + 1   41b) reflects over x-axis, shifts left 2 and up 1

43a) -f(x + 5) - 1 = - (x + 5)² - 1   43b) reflects over x-axis, shifts left 5 and down 1

45a) -m(x - 2) + 1 = -(x − 2)³ + 1   45b) reflects over x-axis, shifts right 2, up 1

47a) -m(x - 5) - 1 = -(x − 5)³ - 1   47b) reflects over x-axis, shifts right 5, down 1
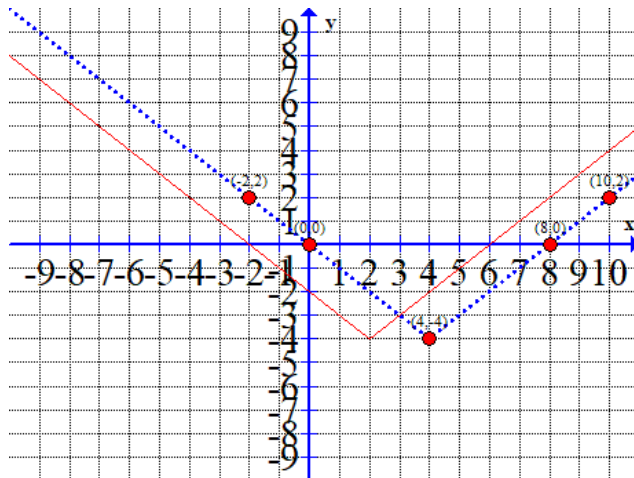
49a) 2f(x) = 2x²   49b) stretches

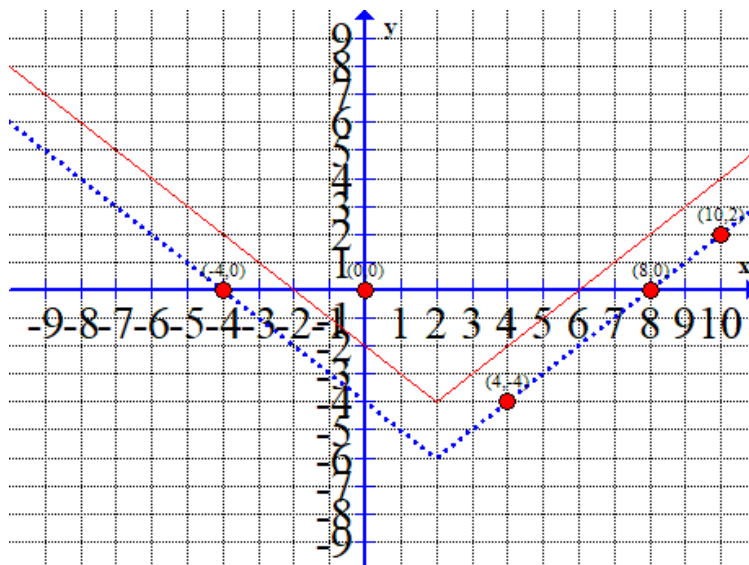53a) $\frac{1}{2}h(x) = \frac{1}{2}|x|$ 53b) compresses

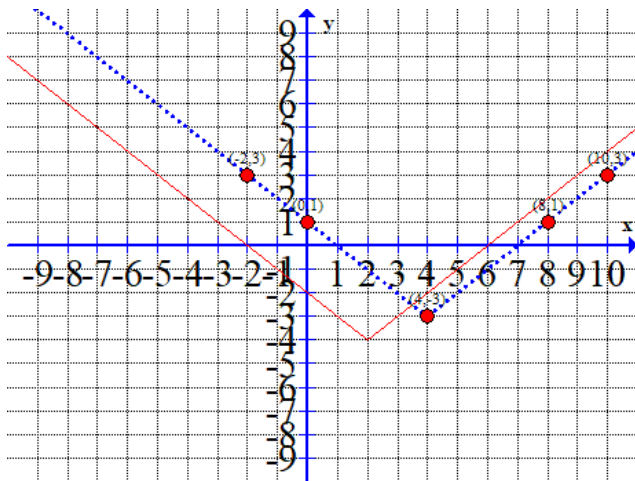55a) $-\frac{1}{2}h(x) = -\frac{1}{2}|x|$ 55b) reflects over x axis, and compresses
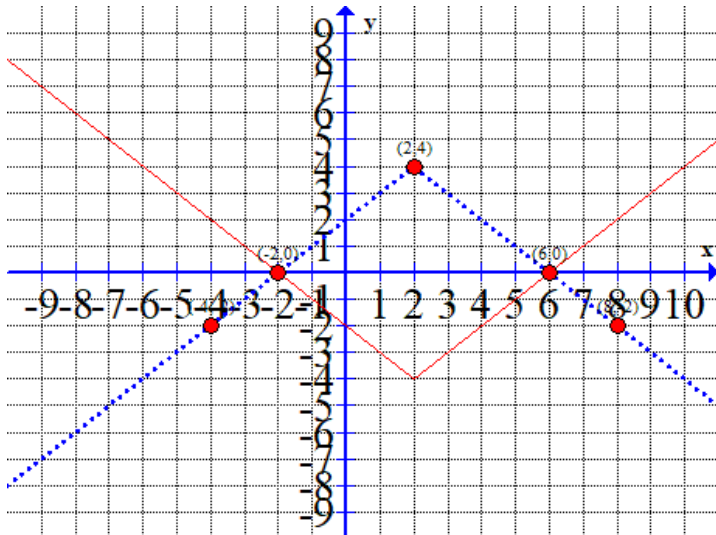
57) f(x − 2) (shift each point 2 to the right)
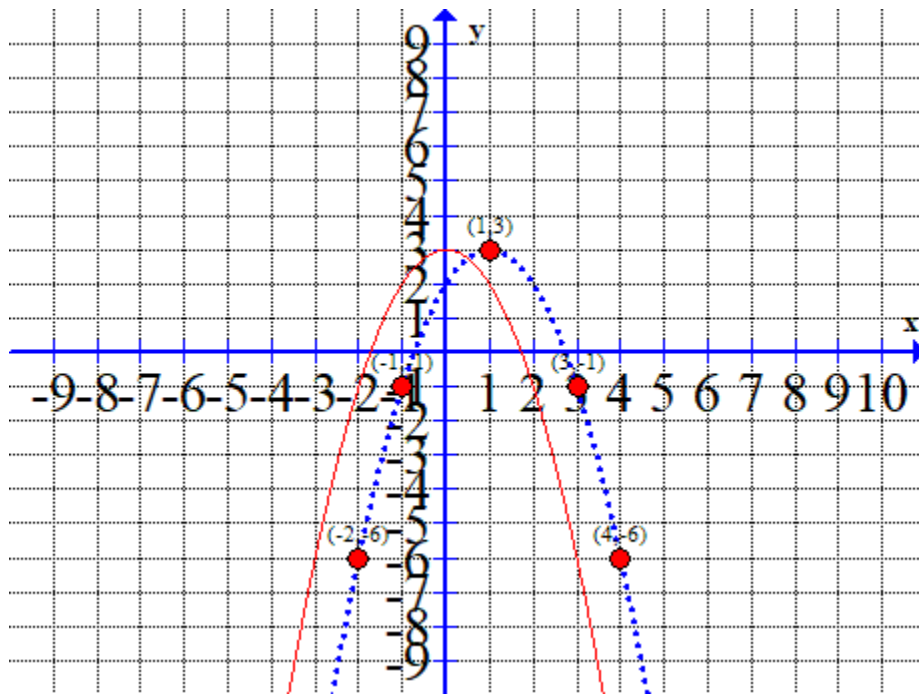

59)   f(x) – 2 shift each point down 2
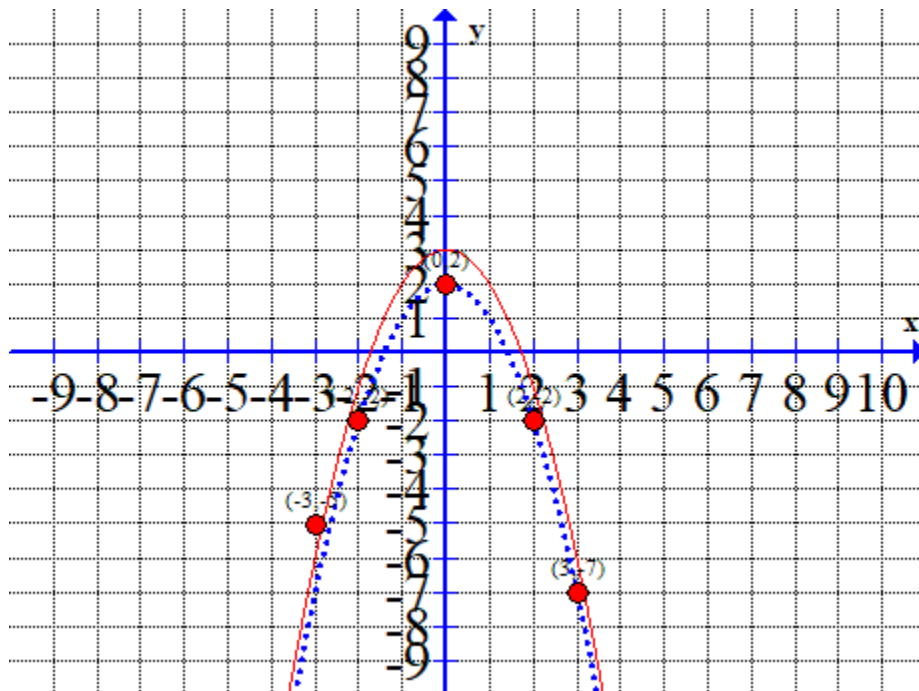
61) f(x-2) + 1   shift each point right 2 and up 1

63) -f(x)   reflect over x-axis by changing y-coordinate of each point
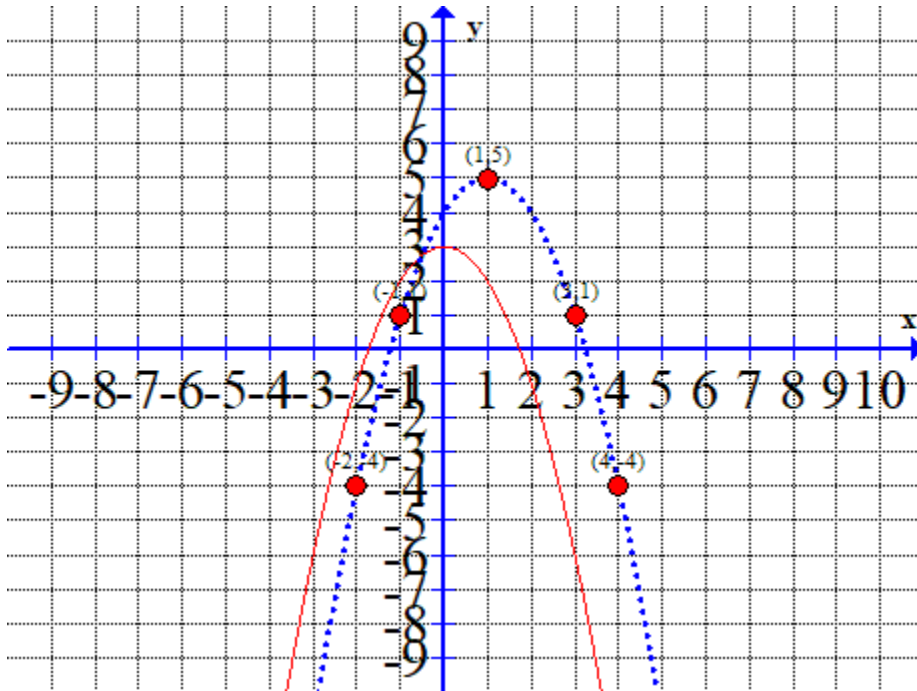
65) f(x − 1)   shift each point to the right 1

67) f(x) − 1 shift each point down 1

69) f(x − 1) + 2   shift each point 1 to the right and up 2

(1,5)
(-2,3)   (3,1)
(-2,-4)   (4,-4)

71) f(-x) reflect over y-axis by changing the sign of each x

This will give you the original graph back. The original graph is symmetric to the y-axis, so reflecting the graph over the y-axis produces the original graph again.

(0,3)
(-2,1)   (2,1)
(-3,-6)   (3,-6)