# Families of Functions (2.6): 1-6, 8, 10-15, 19, 36-38, 51-54

1. Shift up by 6
2. Vertically scale by a factor of 0.25
3. Shift right by 4
4. Flip horizontally
5. Slide left by 1, Slide down by 2
6. Vertically scale by 2, then slide up by 1
8. **One possible example**. With the function $f(x) = x$, a horizontal shift left by 1 unit is the same as a vertical shift up by 1 unit. They both result in the function $g(x) = x + 1$.
10. This function is a vertical translation down of 3 units from the original function.
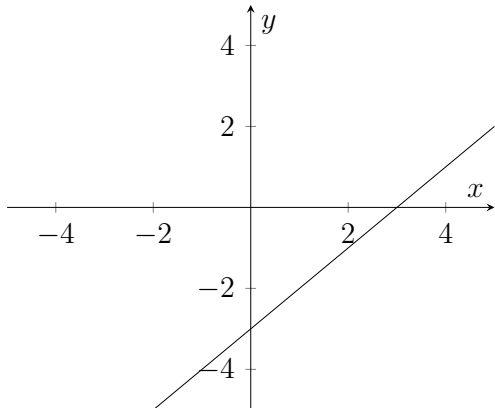
11. Vertical shift up by 4.5 units.
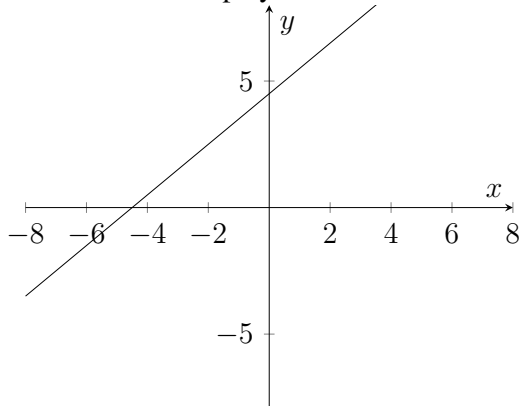
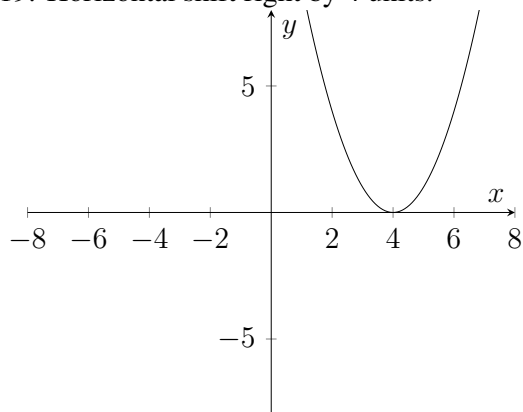12. Vertical shift up by 1.5 units.
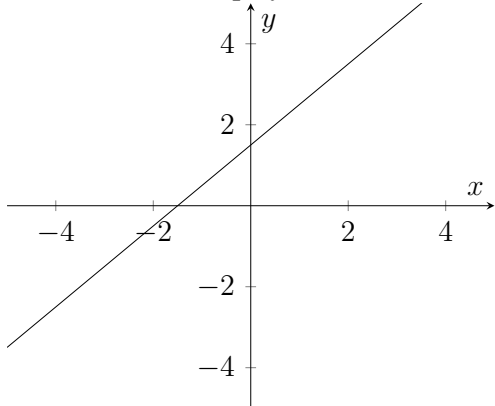
13.

x	$f(x)$	$f(x)+3$
-2	3	6
0	1	4
1	-2	1
3	-1	2

14.

$f(x)-1$
0
-1
-5
1

15.

$f(x)+4$
5
2
4
7

19. Horizontal shift right by 4 units.

36. Vertical reflection

$$f(x) = -2x + 1$$
$$g(x) = 2x - 1$$

37. Vertical reflection

$$f(x) = -\frac{1}{3}x - 1$$
$$g(x) = \frac{1}{3}x + 1$$

38. Horizontal reflection

$$f(x) = -2x + 2$$
$$g(x) = 2x + 2$$

51. D
52. F
53. A
54.

$$\frac{772}{40} = \frac{weight}{100}$$
$$1930 = weight$$

Absolute Value Functions (2.7): 1-4, 23-24, 29-30, 32

1. Vertex at $(-4, -3)$. Axis of symmetry at $x = -4$
2. Vertex at $(-3, 9)$. Axis of symmetry at $x = -3$
3. Stretch.
4. Stretch.
23. Vertex at $(-2, -4)$. Axis of symmetry at $x = -2$. Horizontal translation left by 2. Vertical translation down by 4.
24. Vertex at $(6, 0)$. Axis of symmetry at $x = 6$. Vertical stretch by a factor of $3/2$.
29. $y = -2|x - 5| + 1$
30. $y = \frac{1}{2}|x + 2| - 6$
32. There are no x-intercepts. y-intercept at 13.