

Exercise 4

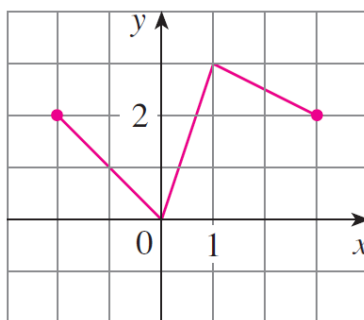
The graph of f is given. Draw the graphs of the following functions.

(a) $y = f(x) - 3$

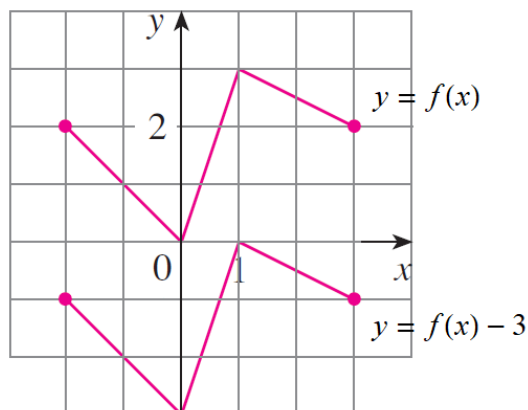
(b) $y = f(x + 1)$

(c) $y = \frac{1}{2}f(x)$

(d) $y = -f(x)$

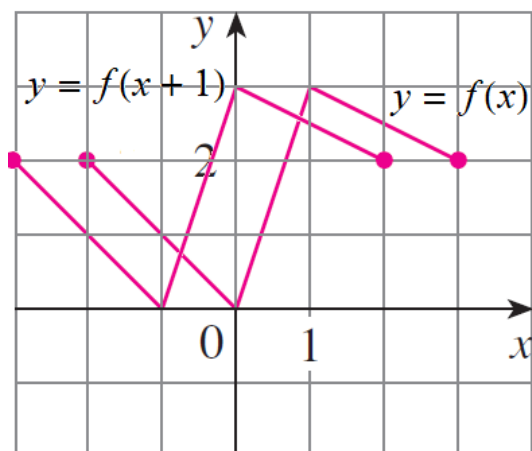
**Solution****Part (a)**

Subtracting 3 from $f(x)$ moves the entire graph of $f(x)$ down by 3 units.

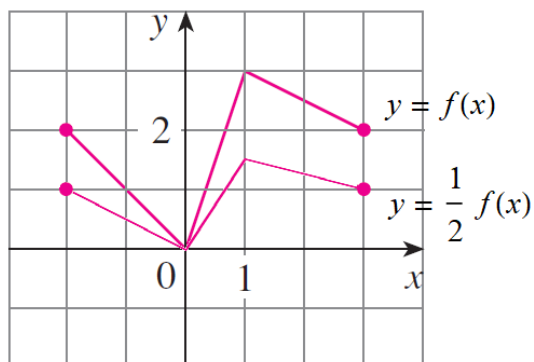


Part (b)

Replacing x with $x + 1$ in the argument of f shifts the entire graph to the left by 1 unit.

**Part (c)**

Placing a factor of $1/2$ in front of $f(x)$ shrinks the entire graph by a factor of 2.



Part (d)

Placing a negative sign in front of $f(x)$ reflects the entire graph about the x -axis.

