

Exercise 2

Explain how each graph is obtained from the graph of $y = f(x)$.

(a) $y = f(x) + 8$

(b) $y = f(x + 8)$

(c) $y = 8f(x)$

(d) $y = f(8x)$

(e) $y = -f(x) - 1$

(f) $y = 8f\left(\frac{1}{8}x\right)$

Solution

Suppose $y = f(x)$ is known.

- (a) Shift the graph of $f(x)$ up by 8 units.
- (b) Shift the graph of $f(x)$ left by 8 units.
- (c) Vertically stretch the graph of $f(x)$ by a factor of 8.
- (d) Horizontally shrink the graph of $f(x)$ by a factor of 8.
- (e) Reflect the graph about the x -axis and shift the graph of $f(x)$ down by 1 unit.
- (f) Vertically and horizontally stretch the graph of $f(x)$ by a factor of 8.