Exercise 22

For the following exercises, determine the domain and range of the quadratic function.

$$f(x) = -2(x+3)^2 - 6$$

Solution

Any value of x can be plugged into a polynomial function, so the domain is

$$\{x \mid -\infty < x < \infty\}.$$

Because the coefficent of the squared term is negative, the parabola opens downward; in other words, the squared term takes on values between $-\infty$ to 0. The smallest value of $f(x)$ is $-\infty - 6 = -\infty$, and the highest value of $f(x)$ is $0 - 6 = -6$.

$$\{y \mid \infty < y \leq -6\}$$