DOMAIN AND RANGE The domain of a function consists of the values of x for which the function is defined. The range consists of the values of $f(x)$ where x is in the domain of f. The graph of a function f is the set of all points $(x, f(x))$.

EXAMPLE 3 **Graph a function**

GRAY WOLF The gray wolf population in central Idaho was monitored over several years for a project aimed at boosting the number of wolves. The number of wolves can be modeled by the function $f(x) = 37x + 7$ where x is the number of years since 1995. Graph the function and identify its domain and range.
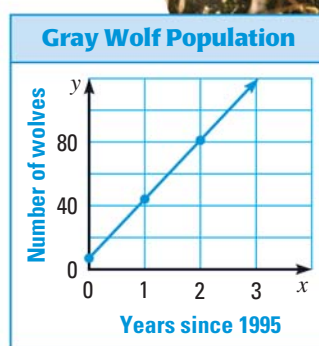
INTERPRET MODELS
The rate of change in the wolf population actually varied over time. The model simplifies the situation by assuming a steady rate of change.

Solution

To graph the function, make a table.

x	f(x)
0	$37(0) + 7 = 7$
1	$37(1) + 7 = 44$
2	$37(2) + 7 = 81$

Gray Wolf Population

The domain of the function is $x \geq 0$. From the graph or table, you can see that the range of the function is $f(x) \geq 7$.

✓ **GUIDED PRACTICE** for Examples 2 and 3

2. **WOLF POPULATION** Use the model from Example 3 to find the value of x so that $f(x) = 155$. *Explain* what the solution means in this situation.

FAMILIES OF FUNCTIONS A **family of functions** is a group of functions with similar characteristics. For example, functions that have the form $f(x) = mx + b$ constitute the family of *linear* functions.

KEY CONCEPT *For Your Notebook*

Parent Function for Linear Functions

The most basic linear function in the family of all linear functions, called the **parent linear function**, is:

$$f(x) = x$$

The graph of the parent linear function is shown.