# 1.6 Represent Functions as Rules and Tables

TEKS A.1.A, A.1.B, A.1.C, A.2.B

**Before** You wrote algebraic expressions and equations.

**Now** You will represent functions as rules and as tables.

**Why?** So you can describe consumer costs, as in Example 1.

**Key Vocabulary**
- **function**
- **domain**
- **range**
- **independent variable**
- **dependent variable**

When you pump gas, the total cost depends on the number of gallons pumped. The total cost is a *function* of the number of gallons pumped.

A **function** consists of:

- A set called the **domain** containing numbers called **inputs**, and a set called the **range** containing numbers called **outputs**.
- A pairing of inputs with outputs such that each input is paired with exactly one output.

## EXAMPLE 1 Identify the domain and range of a function

The input-output table shows the cost of various amounts of regular unleaded gas from the same pump. Identify the domain and range of the function.


| Input (gallons) | 10 | 12 | 13 | 17 |
|---|---|---|---|---|
| Output (dollars) | 19.99 | 23.99 | 25.99 | 33.98 |

**Solution**

▶ The domain is the set of inputs: 10, 12, 13, and 17. The range is the set of outputs: 19.99, 23.99, 25.99, and 33.98.

## ✓ GUIDED PRACTICE for Example 1

**1.** Identify the domain and range of the function.

| Input | 0 | 1 | 2 | 4 |
|---|---|---|---|---|
| Output | 5 | 2 | 2 | 1 |

**MAPPING DIAGRAMS** A function may be represented by a *mapping diagram*. Notice that an output may be paired with more than one input, but no input is paired with more than one output.