**EXAMPLE 5**   **TAKS REASONING: Multi-Step Problem**

RUNNING The distance d (in miles) that a runner travels is given by the function $d = 6t$ where t is the time (in hours) spent running. The runner plans to go for a 1.5 hour run. Graph the function and identify its domain and range.

Solution

ANALYZE GRAPHS

In Example 2, the domain is unrestricted, and the graph is a *line*. In Example 4, the domain is restricted to $x \geq 0$, and the graph is a *ray*. Here, the domain is restricted to $0 \leq t \leq 1.5$, and the graph is a *line segment*.

STEP 1   **Identify** whether the problem specifies the domain or the range. You know the amount of time the runner plans to spend running. Because time is the independent variable, the domain is specified in this problem. The domain of the function is $0 \leq t \leq 1.5$.

STEP 2   **Graph** the function. Make a table of values. Then plot and connect the points.

t (hours)	0	0.5	1	1.5
d (miles)	0	3	6	9
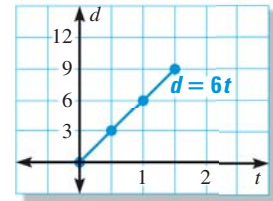
STEP 3   **Identify** the unspecified domain or range. From the table or graph, you can see that the range of the function is $0 \leq d \leq 9$.


EXAMPLE 6   **Solve a related problem**

WHAT IF? Suppose the runner in Example 5 instead plans to run 12 miles. Graph the function and identify its domain and range.

Solution

STEP 1   **Identify** whether the problem specifies the domain or the range. You are given the distance that the runner plans to travel. Because distance is the dependent variable, the range is specified in this problem. The range of the function is $0 \leq d \leq 12$.

SOLVE FOR t

To find the time it takes the runner to run 12 miles, solve the equation $6t = 12$ to get $t = 2$.

STEP 2   **Graph** the function. To make a table, you can substitute d-values (be sure to include 0 and 12) into the function $d = 6t$ and solve for t.

t (hours)	0	1	2
d (miles)	0	6	12
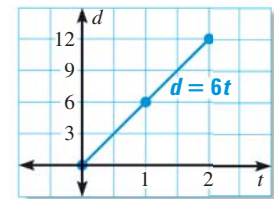
STEP 3   **Identify** the unspecified domain or range. From the table or graph, you can see that the domain of the function is $0 \leq t \leq 2$.

✓   **GUIDED PRACTICE**   **for Examples 5 and 6**

6. **GAS COSTS** For gas that costs $2 per gallon, the equation $C = 2g$ gives the cost C (in dollars) of pumping g gallons of gas. You plan to pump $10 worth of gas. Graph the function and identify its domain and range.