3.3 Function Notation
For use with Exploration 3.3

Essential Question: How can you use function notation to represent a function?

1 EXPLORATION: Matching Functions with Their Graphs

Work with a partner. Match each function with its graph.

a. \( f(x) = 2x - 3 \)  
b. \( g(x) = -x + 2 \)

c. \( h(x) = x^2 - 1 \)  
d. \( j(x) = 2x^2 - 3 \)

A.  
B.  
C.  
D.
3.3 Function Notation (continued)

**EXPLORATION:** Evaluating a Function

Go to BigIdeasMath.com for an interactive tool to investigate this exploration.

Work with a partner. Consider the function

\[ f(x) = -x + 3. \]

Locate the points \((x, f(x))\) on the graph.

Explain how you found each point.

a. \((-1, f(-1))\)

b. \((0, f(0))\)

c. \((1, f(1))\)

d. \((2, f(2))\)

**Communicate Your Answer**

3. How can you use function notation to represent a function? How are standard notation and function notation similar? How are they different?

<table>
<thead>
<tr>
<th>Standard Notation</th>
<th>Function Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(y = 2x + 5)</td>
<td>(f(x) = 2x + 5)</td>
</tr>
</tbody>
</table>
In your own words, write the meaning of each vocabulary term.

function notation

Notes:
3.3 Notetaking with Vocabulary (continued)

Extra Practice

In Exercises 1–6, evaluate the function when \( x = -4, 0, \) and 2.

1. \( f(x) = -x + 4 \)
2. \( g(x) = 5x \)
3. \( h(x) = 7 - 2x \)

4. \( s(x) = 12 - 0.25x \)
5. \( t(x) = 6 + 3x - 2 \)
6. \( u(x) = -2 - 2x + 7 \)

7. Let \( n(t) \) be the number of DVDs you have in your collection after \( t \) trips to the video store. Explain the meaning of each statement.
   a. \( n(0) = 8 \)
   b. \( n(3) = 14 \)
   c. \( n(5) > n(3) \)
   d. \( n(7) - n(2) = 10 \)

In Exercises 8–11, find the value of \( x \) so that the function has the given value.

8. \( b(x) = -3x + 1; b(x) = -20 \)
9. \( r(x) = 4x - 3; r(x) = 33 \)

10. \( m(x) = -\frac{3}{5}x - 4; m(x) = 2 \)
11. \( w(x) = \frac{5}{6}x - 3; w(x) = -18 \)
3.3 Notetaking with Vocabulary (continued)

In Exercises 12 and 13, graph the linear function.

12. \( s(x) = \frac{1}{2}x - 2 \)

13. \( t(x) = 1 - 2x \)

<table>
<thead>
<tr>
<th>x</th>
<th>-4</th>
<th>-2</th>
<th>0</th>
<th>2</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>s(x)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>t(x)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14. The function \( B(m) = 50m + 150 \) represents the balance (in dollars) in your savings account after \( m \) months. The table shows the balance in your friend's savings account. Who has the better savings plan? Explain.

<table>
<thead>
<tr>
<th>Month</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>$330</td>
</tr>
<tr>
<td>4</td>
<td>$410</td>
</tr>
<tr>
<td>6</td>
<td>$490</td>
</tr>
</tbody>
</table>