Module 3 Test Review
Features of Functions

1. Use the graph to the right to answer the following questions.

Use interval notation.

a. Maximum point: __________ 

b. Minimum point: __________ 

c. Increasing: ______________________ 

d. Decreasing: ______________________ 

e. Domain: __________ 

f. Range: __________ 

Determine if the following statements (problems 2-7) are TRUE or FALSE.

2. The graph of a function can have more than one y-intercept. ________

3. The graph of a function can have more than one x-intercept. ________

4. The domain describes the possible inputs of a function. ________

5. The table below represents a function. ________

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>5</td>
</tr>
<tr>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
</tr>
</tbody>
</table>

6. The graph below is a function. ________

7. All mathematical equations are functions. ________

8. Write the equation for each of the following lines. Circle which form of the equation you chose.

a. \( m = \frac{1}{2}, b = -3 \) 
   i. Slope-Intercept Form  
   ii. Point-Slope Form

b. \( m = -2, (3, -5) \) 
   i. Slope-Intercept Form  
   ii. Point-Slope Form

c. \((2, -1) \text{ and } (-1, -10)\) 
   i. Slope-Intercept Form  
   ii. Point-Slope Form

d. \((0,5) \text{ and } (-4,7)\) 
   i. Slope-Intercept Form  
   ii. Point-Slope Form
9. The functions $f(x)$ and $g(x)$ are defined in the table below. Each function is continuous on the domain of $(-\infty, \infty)$, or all real numbers, $\mathbb{R}$.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$f(x)$</th>
<th>$g(x)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$-3$</td>
<td>14</td>
<td>-12</td>
</tr>
<tr>
<td>$-1$</td>
<td>6</td>
<td>-6</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>-3</td>
</tr>
<tr>
<td>2</td>
<td>-6</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>-26</td>
<td>18</td>
</tr>
</tbody>
</table>

a. Write an explicit equation for each function, $f(x)$ and $g(x)$.

$$f(x) = \underline{\phantom{00000}} \quad g(x) = \underline{\phantom{00000}}$$

b. Find $h(x)$, which is the sum of $f(x)$ and $g(x)$; $h(x) = f(x) + g(x)$.

$$h(x) = \underline{\phantom{00000}}$$

c. What is the value of $f(-3) + g(-3)$?

d. What is the value of $f(-1) - g(-1)$? e. What is the value of $f(0) + g(0)$?

10. Use the graph to the right to answer the following:

a. $f(2) = \underline{\phantom{00000}}$

b. For what value of $x$ does $g(x) = 4$?

c. For what values of $x$ is $g(x) > f(x)$?

d. Find the value of $f(-1) + g(-1)$.

11. Use the graph to the right to answer the questions below. Estimate where needed.

a. Maximum: \underline{\phantom{00000}}

b. Minimum: \underline{\phantom{00000}}

Use **set notation** for the following questions:

c. The domain of the graph is: \underline{\phantom{00000}}

d. The range of the graph is: \underline{\phantom{00000}}

Use **interval notation** for the following questions:

e. The graph is increasing on the interval(s) of: \underline{\phantom{00000}}

f. The graph is decreasing on the interval(s) of: \underline{\phantom{00000}}

g. The interval(s) where $f(x) > 0$ is: \underline{\phantom{00000}}

h. The interval(s) where $f(x) \leq 0$ is: \underline{\phantom{00000}}

i. $f(5) = \underline{\phantom{00000}}$

j. If $f(x) = 2$, the $x = \underline{\phantom{00000}}$