Homework 4-29

Suppose that $f(t)$ is the function whose graph is shown at right.

1. Fill in the table of values for the function $g(x) = \int_0^x f(t) \, dt$.

<table>
<thead>
<tr>
<th>$x$</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>$g(x)$</td>
<td></td>
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</tbody>
</table>

2. Graph $g(x)$ on the domain $0 \leq x \leq 12$. Be sure to properly label your graph.

3. Fill in the table of values for the function $h(x) = \int_6^x f(t) \, dt$.

<table>
<thead>
<tr>
<th>$x$</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>$h(x)$</td>
<td></td>
<td></td>
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</table>

4. Graph $h(x)$ on the same axes as $g(x)$ above.
5. Suppose that $f(t)$ is the function whose graph is shown at right. Let

$$g(x) = \int_0^x f(t) \, dt$$

Compute each of the following. Approximate answers are okay.

(a) $g(0)$
(b) $g(0.5)$
(c) $g(1)$
(d) $g(1.5)$
(e) $g(2)$

6. With $f$ and $g$ as in Problem 5:

(a) Estimate $g(4) - g(3)$. Shade an area that matches your computation.
(b) Estimate $g(2.5) - g(2)$. Shade an area that matches your computation.
(c) Estimate $g(1.25) - g(1)$. Shade an area that matches your computation.
(d) Compute the secant slope of $g$ on the interval $[3, 4]$.
(e) Compute $f(3.5)$.
(f) Compute the secant slope of $g$ on the interval $[2, 2.5]$.
(g) Compute $f(2.25)$.
(h) Compute the secant slope of $g$ on the interval $[1, 1.25]$.
(i) Compute $f(1.125)$. 
Selected Answers

1.  

\[
\begin{array}{c|c|c|c|c|c|c}
 x & 1 & 3 & 5 & 7 & 9 & 11 \\
g(x) & -3 & -3 & 4 & 11.5 & 15.5 & 15.5 \\
\end{array}
\]

2.  

\[
\begin{array}{c|c|c}
 x & 0 & 6 \\
h(x) & -8 & 0 \\
\end{array}
\]

3. These are approximations based on my counting of squares. Each square has area 1/16, so:

(a) 0
(b) \(-9/16\)
(c) \(-8/16\)
(d) \(-3/16\)
(e) \(-6/16\)

4. Computations involving \(g\) are estimates based on counting squares. Computations of \(f\) are from reading the graph.

(a) \(28/16\)
(b) \(11/16\)
(c) \(2.5/16\) or \(5/32\)
(d) \(28/16\) or \(1.75\)
(e) \(1.75\)
(f) \(11/8\) or \(1.375\)
(g) about \(1.3\) or \(1.4\)
(h) \(5/8\) or \(0.675\)
(i) about \(0.6\) or \(0.7\)