Webwork Section 5.3 #22

Book Problem 59

The velocity of a car was read from its speedometer at 10-second intervals and recorded in the table. Use the midpoint rule to estimate the distance traveled by the car.

<table>
<thead>
<tr>
<th>t(s)</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>v(mi/h)</td>
<td>0</td>
<td>25</td>
<td>49</td>
<td>53</td>
<td>58</td>
<td>64</td>
<td>67</td>
<td>50</td>
<td>54</td>
<td>46</td>
<td>37</td>
</tr>
</tbody>
</table>

Estimate = \[ \frac{20}{3600} \text{ hr} \] 

\[ \Delta x = \frac{100 - 0}{5} = 20 \text{ sec} \]

Divide the interval \([0, 100]\) into 5 subintervals.

\[ M_5 = V(10) \Delta x + V(30) \Delta x + V(50) \Delta x + V(70) \Delta x + V(90) \Delta x \]

\[ = (25 + 53 + 64 + 50 + 46) \left( \frac{20}{3600} \right) \]

\[ = 1.322222... \]