3. [13 points] Tom organizes another meeting of his Science Club, but this time only Anne and John can make it. The meeting is at 2 pm, so they both start walking from their houses to Tom’s at 1 pm. At 1:18 pm, Anne realizes she forgot her wallet, so she goes back home to get it before heading over to Tom’s house.

Anne’s distance in kilometers, \(A(t)\), and John’s distance in kilometers, \(J(t)\), to Tom’s house \(t\) hours after 1 pm are given by the graph and the table below. Assume that both of them walk along a straight line.

<table>
<thead>
<tr>
<th>(t)</th>
<th>0</th>
<th>0.2</th>
<th>0.4</th>
<th>0.5</th>
<th>0.8</th>
<th>0.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>(J(t))</td>
<td>5.5</td>
<td>4.3</td>
<td>3.2</td>
<td>2.8</td>
<td>0.8</td>
<td>0</td>
</tr>
</tbody>
</table>

\[
y = A(t)
\]

\[(0.3, 3.5)\] \[(0.6, 4.2)\]

\[
t  
0.25 0.5 0.75 1 1.25
\]

a. [1 point] How many kilometers from Tom’s house is Anne’s house?

Answer: ______________________

b. [2 points] Estimate \(J'(0.4)\). Show all your computations. Include units.

Answer: ______________________

c. [3 points] Rank John’s average velocity over the time intervals

- (I) \(0.2 \leq t \leq 0.4\)
- (II) \(0.5 \leq t \leq 0.9\)
- (III) \(0.8 \leq t \leq 0.9\)

from least to greatest. Show your work and indicate your final answer by filling in the blanks with I, II, III.

\[\underline{____} \leq \underline{____} \leq \underline{____}\]

d. [2 points] What was the total distance travelled by Anne?

Answer: ______________________

e. [2 points] At which of the following times was Anne’s speed the largest? Circle the correct answer(s).

- \(t = 0.05\)
- \(t = 0.3\)
- \(t = 0.4\)
- \(t = 0.6\)
- \(t = 1\)

f. [3 points] On which of the following intervals is \(A(t)\) invertible? Circle the correct answer(s).

- \([0, 0.6]\)
- \([0.3, 0.6]\)
- \([0.1, 0.5]\)
- \([0.6, 1]\)
- \([0, 1]\)