4. [10 points] For your convenience, the graphs of \( p(t) \) and \( q(t) \) are reprinted below. Recall:

- The rate, in donuts per hour, at which Xanthippe makes donuts \( t \) hours after 7 am is modeled by the function \( p(t) \).
- The rate, in donuts per hour, at which customers purchase donuts \( t \) hours after 7 am is modeled by the function \( q(t) \).
- Assume that at 7 am, Xanthippe begins with no donuts in stock.

![Graph of p(t) and q(t)](image)

**a. [4 points]** Estimate the total number of donuts produced by 10 am using a right-hand Riemann sum with two equal subintervals. Be sure to write down all the terms in your sum. Is your answer an underestimate or overestimate?

**Answer:** donuts produced by 10 am \( \approx \) 

This is an (circle one) Overestimate Underestimate

**b. [4 points]** The number of donuts in stock \( t \) hours after 7 am is modeled by the function \( s(t) \). Estimate the \( t \)-values for all critical points of \( s(t) \) in the interval \( 0 < t < 4 \), and estimate all values of \( t \) in the interval \( 0 < t < 4 \) at which \( s(t) \) has a local extremum. For each answer blank write NONE if appropriate. You do not need to justify your answers.

**Answer:** Critical point(s) at \( t = \) 

Local max(es) at \( t = \) Local min(s) at \( t = \)

**c. [2 points]** At what time is the number of donuts that Xanthippe has in stock the greatest? Round your answer to the nearest half hour. You do not need to justify your answer.

**Answer:**