1. [13 points] Caroline uses a remote-controlled boat to survey a reservoir. The boat starts at the point (x, y) = (0, 0), and after t seconds is positioned at x = f(t) and y = g(t). A graph of f(t) and a formula for g(t) are given below. Note that f(t) is linear on the the intervals [0, 3], [5, 7], and [7, 10], and has a local maximum at t = 4.



For each of the following parts, your final answer should **not** include the letters f or g. **a.** [2 points] Where is the boat located after 10 seconds?

Answer: x =_____ and y =_____

b. [3 points] Are there any times during these 10 seconds at which the boat comes to a complete stop? If so, list all such times. If not, write NONE.

Answer: t =_____

c. [4 points] Write an expression involving one or more integrals for the total distance traveled by the boat during the **first 3 seconds**. Do not evaluate any integrals in your answer.

Answer:

d. [4 points] What is the tangent line to the boat's path at t = 9? Give your answer in cartesian form.