Show all work, clearly and legibly, to receive full credit. Correct spelling, organization of your solution, and proper use of mathematical notation all count. You may use a calculator, but no notes, books, or other resources. Good luck!

1.) (5 pts.) Suppose you are working on a related rates problem about a rectangle, and the formula that relates all your variables is \( A = bh \), where \( A \) is the area of the rectangle, \( b \) is the base, and \( h \) is the height.

Compute the derivative of \( A = bh \), with all variables changing with respect to time, \( t \).

2.) (5 pts.) The graph below shows a function \( f(x) \), which is made up of a half-circle and a line. Compute \( \int_{0}^{4} f \). (Hint: the integral is "area under the curve" for only PART of the graph shown.)