(8.) (12 pts) From Exam I, we have that the population of Michigan can be approximated by
$$P = f(t) = 7.8(1.0058)^t,$$
where t is the number of years since the beginning of 1960 and P is in millions.

(a) Determine the average rate of change in the population of Michigan between 1960 and 1980. [Be certain to include units and express your answer as a complete sentence.]

(b) Determine the (instantaneous) rate of change of the population of Michigan at the beginning of 1980. [Again, use units and a sentence. Show your work.]

(c) Which is greater—the average rate of change between 1960 and 1980 or the instantaneous change in 1980? Use a graph or tables to give a convincing argument that the rate that you *found* to be greater should indeed *be* greater.

(d) Is there some time, t, such that the instantaneous rate of change of P is equal to the average rate of change from 1960 to 1980? If so, approximate t. If not, explain why not.