

5. (14 points) Suppose that the temperature (in degrees Celsius) on December 10th at the North Pole was described by the function  $f(t) = -0.3t^2 + 7t - 38$ , where  $t$  is hours after midnight for values of  $0 \leq t \leq 24$ .

(a) Find the average rate of change in temperature between 5 am and 2 pm. Show your work.

(b) Find the average temperature between the hours of 5 am and 2 pm. Show your work.

(c and d) On the first sketch of  $f(t)$  given in the figure below, show how the value from part (a) can be represented graphically. Use the second graph below to approximate a time  $t$  for which  $f'(t)$  is equal to the average rate of change of temperature from part (a). Show how this can be represented graphically. Carefully label and explain what you are indicating on each graph.

