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.