**Problem statement** The amount of a substance which can be dissolved in a solution may vary with temperature. Below is a graph of the solubility (the maximum amount of the substance) in grams of sodium sulfate, Na_2SO_4, which can be dissolved in 100 grams of water as a function of temperature in degrees Celsius. Suppose $S(T)$ is the solubility at temperature T. Use the graph to answer the following questions as well as you can.
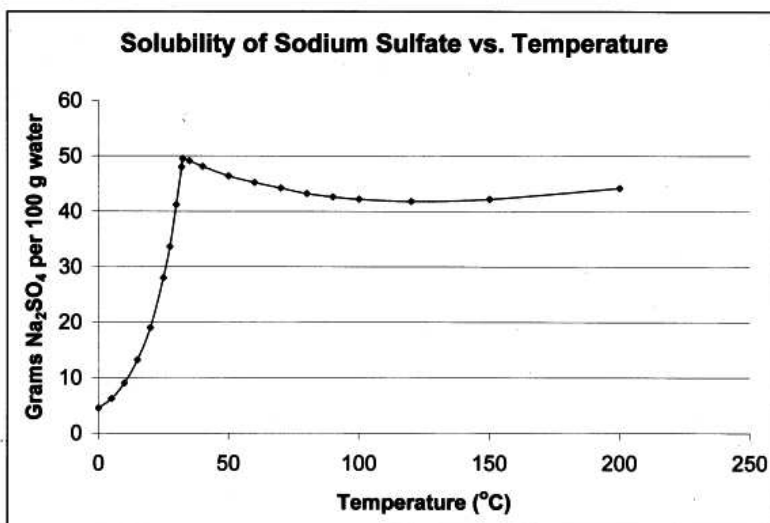
a) Where is $S(T)$ continuous? Where is $S(T)$ differentiable?

b) Where is $S(T)$ increasing? Where is it decreasing? Does $S(T)$ have any local extrema? If yes, where and what type?

c) In what intervals is $S(T)$ concave up? In what intervals is $S(T)$ concave down? Does $S(T)$ have any points of inflection?

d) Sketch a graph of $S'(T)$. What are the units on each axis of your graph?