1. Tony Stark is developing a new model of the Iron Man suit. His previous suit model uses an average of 222.4 kilowatts (kW), and he wishes to see if his new model is more efficient (in other words, if the mean energy consumption in kW is less than the previous model). He takes a sample of five randomly selected suits made under the new model and finds that the mean energy consumption is 210.2 kW with a standard deviation of 9.9 kW. He knows that the energy consumption for a given suit follows a normal distribution based on his previous tests. Test Tony's hypothesis at the $\alpha = 0.01$ significance level.

   (a) Define the **parameter** of interest and state the **hypotheses**.

   (b) Verify that the necessary **conditions** hold to conduct a hypothesis test for mean. (Suppose that he has already made 100 suits using the new model.)

   (c) Find the appropriate **test statistic**.

   (d) Find the **p-value** for the hypothesis test.

   (e) State your **conclusion** in context of the problem.