MATH 300: One-sample hypothesis testing practice

For the following scenarios:
1. Write out the null and alternate hypotheses
2. Describe the consequences of _ and _ errors. Choose an appropriate _-level.
3. Calculate or write out the sample statistics ($\overline{X}$, s , and n)
4. Sketch the sampling distribution of interest
5. Calculate the p-value (or find the critical region on the sampling distribution)
6. Draw a conclusion (do you reject or retain the null hypothesis?)

1. Do middle-aged male executives have different average blood pressure than the general population?
   The National Center for Health Statistics reports that the mean systolic blood pressure for males 35-44 years of age is 128 and the standard deviation of this population is 15. The medical director of a company looks at the medical records of 72 company executives in this age group and finds that the mean systolic blood pressure in this sample is 126.07. Is this evidence that executive blood pressures differ from the national average?

2. In a discussion of SAT scores, someone comments:
   > *Because only a minority of high school students take the test, the scores overestimate the ability of typical high school seniors. The mean SAT mathematics score is about 508, but I think that if all seniors took the test, the mean score would be no more than 450.*

   You gave the test to a random sample of 50 seniors from California. These students had a mean score of 475 with a standard deviation of 97. Does this provide evidence against the claim that the mean for all California seniors is no more than 450?

   Extra: If we assume the true mean SAT score for California students is 470, what is the power of this test?