AP* Statistics Quiz B – Chapter 20   *Name* _____

The board of directors for Procter and Gamble is concerned that only 19.5% of the people who use toothpaste buy Crest toothpaste. A marketing director suggests that the company invest in a new marketing campaign which will include advertisements and new labeling for the toothpaste. The research department conducts product trials in test markets for one month to determine if the market share increases with new labels.

1. Write the company's null and alternative hypotheses.

2. In this context describe a Type I error and the impact such an error would have on the company.

3. In this context describe a Type II error and the impact such an error would have on the company.

4. Based on the data they collected during the trial the research department found that a 98% confidence interval for the proportion of all consumers who might buy Crest toothpaste was (16%, 28%). What conclusion should the company reach about the new marketing campaign? Explain.

5. What level of significance did the research department use?

6. Describe to the board of directors an advantage and a disadvantage of using a 5% alpha level of significance instead.

7. The board of directors asked the research department to extend the trial period so that the decision can be made on two months worth of data. Will the power increase, decrease, or remain the same?

8. Over the trial month the market share in the sample rose to 22% of shoppers. The company's board of directors decided this increase was significant. Now that they have concluded the new marketing campaign works, why might they still choose not to invest in the campaign?