For each problem, state the correct procedure. If the problem is a significance test, state the correct hypotheses.

1. A group of 300 housewives was interviewed to determine if there is a preference for one of two detergents. Detergent A was favored by 135 housewives; the others favored Detergent B. Which procedure would you perform to ascertain if the data provide sufficient evidence to indicate a difference in preference for the two detergents?
2. The Mendelian law of segregation in genetics states that when certain types of peas are crossed, the following four varieties, round and yellow (RY), round and green (RG), wrinkled and yellow (WY), and wrinkled and green (WG), are obtained in the ratio 9:3:3:1 In a greenhouse experiment, an agriculturist found that there were 652 RY, 200 RG, 185 WY and 83 WG. Using a 5 percent level of significance, test the null hypothesis that these observed frequencies are consistent with those expected in theory.
3. If a new process for copper mining is to be adopted, it must produce at least 50 tons of ore per day. A 5-day trial gave the following results: 50 47 53 51 52 Do these figures warrant the adoption of the new process?
4. Two sets of 60 high school students each were taught algebra by two methods, respectively. The experimental group used programmed learning and no formal lectures; the control group was given formal lectures by a teacher. At the end of the experiment both groups were given a standardized test, and the number of students scoring above 85% was recorded: 41 out of 60 of the experimental group had scores above 85%; 24 out of 60 in the control group had scores above 85%. Test the hypothesis that the two groups were not different in their performance on the standardized test.
5. Ten sets of identical twins, all wanting to learn French, were divided into two groups, each group containing one of each twin pair. Group 1 was flown to France, where they lived for one month. Group 2 was enrolled in an intensive French course at a local university. At the end of one month, all subjects were given a standard French language exam. Which procedure is appropriate for performing the analysis of the exam scores?
6. ****A survey was conducted to investigate whether drinking alcohol and smoking tobacco are related. The following info was compiled for 600 individuals. Which procedure would be used to test the hypothesis that smoking and drinking are related?
7. A vegetable canner claims that the mean fill per 16-ounce can is 16.1 ounces. Several underweight complaints have been lodged against the company, and the canner wants to see if the machine setting for the fill mechanism is correct. That is, he wishes to test the hypothesis that µ = 16.1 ounces. Experience with the machine has shown that the variation in fill observed over a number of years is σ = .11 ounces. A random sample of n = 10 cans gave the following measurements in ounces: 16.1, 16.0, 16.2, 15.9, 16.0, 16.1, 16.1, 15.9, 16.1, 16.0. Do these data indicate that µ differs from 16.1 ounces?
8. The length of time in hours to the first repair were recorded for thirty new lawn mowers for each of two brands. The mean and variances for the two samples, one from each brand, were, respectively: Brand A: 137 and 420. Brand B: 115 and 595. Do the data present sufficient evidence to indicate a difference in the mean time to the first repair for the two different brands?
9. A manufacturer claims that, at most, 5% of the goods he produces are defective. If out of 200 items randomly selected from his production 14 are found to be defective, check his claim using a hypothesis test with a .05 significance level.
10. You want to estimate the difference in the life of Duracell and Eveready batteries.
11. According to a recent survey, a typical teenager has 38 contacts stores in his/her phone. Is this true at NPHS?
12. You would like to estimate the percent of students at NPHS who have a twitter account.
13. ****The data summarized in this two-way chart reflect the results of asking 50 students in a public school and 50 students in a private school what musical instrument they had learned to play. In cases where students had learned to play more than one instrument, they were instructed to choose the instrument they had played for the longest amount of time:
14. The number of accidents in a factory for each month is provided:

Jan Feb Mar Apr May June July Aug Sep Oct Nov Dec

25 28 24 18 17 27 9 18 22 14 12 26

Which hypothesis test would be appropriate for determining whether some months have a greater number of accidents than others?

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