Review 10 AP Statistics Name:

1. You have two large bins of several thousand plastic beads. Bin A is 60% red beads; Bin B is 48% red beads. Suppose you take a random sample of 80 beads from each bin and calculate $\hat{p}_A$ = the proportion of red beads in the sample from Bin A and $\hat{p}_B$ = the proportion of red beads in the sample from Bin B.

(a) Describe the sampling distribution of $\hat{p}_A - \hat{p}_B$.

(b) What is the probability that the proportion of red beads you select from Bin B is higher than the proportion of red beads you select from Bin A?

2. Just before the presidential election in November 2008, a local newspaper conducted a poll of residents of a medium-sized city and found that 120 out of a simple random sample of 250 men intended to vote for Barack Obama and 132 out of an SRS of 240 women intended to vote for Obama.

(a) Is this convincing evidence that there was a gender difference in Obama's support in this city? Support your conclusion with a test of significance, using $\alpha = 0.05$.

(b) Construct and interpret a 95% confidence interval for the difference in proportion of women and men who supported Obama in this city.

3. In a study of heart surgery, one issue was the effect of drugs called beta-blockers on the pulse rate of patients during surgery. The available subjects were divided at random into two groups of 30 patients each. One group received a beta-blocker; the other group received a placebo. The pulse rate of each patient at a critical point during the operation was recorded. The treatment group had a mean pulse rate of 65.2 and standard deviation 7.8. For the control group, the mean pulse rate was 70.3 and the standard deviation was 8.3.

(a) Find the standard error for the difference in mean pulse rate between the two groups.

(b) Construct and interpret a 99% confidence interval for the difference in mean pulse rates.

(c) Suppose we want to test the hypothesis that beta-blockers reduce mean pulse rate. State the null and alternative hypotheses for this test.

(d) The test statistic is $t = -2.453$. Determine the P-value and draw an appropriate conclusion, using $\alpha = 0.05$.