Quiz 10.1B AP Statistics Name:

1. According to the manufacturer, 20% of plain M&M's are orange, and 23% of peanut M&M's are orange. Suppose you were able to take a simple random sample of 240 of each candy type. Let $\hat{p}_1$ = the sample proportion of plain M&M's that are orange and $\hat{p}_2$ = the sample proportion of peanut M&M's that are orange.

   (a) Describe the sampling distribution of $\hat{p}_1 - \hat{p}_2$.

   (b) What is the probability that you select a higher proportion of plain orange M&M's than peanut orange M&M's?

2. A state policeman has a pet theory that people who drive red cars are more likely to drive too fast. On his day off, he borrows one of the department's radar guns, parks his car in a rest area, and measures the proportion of red cars and non-red cars that are driving too fast. (He decides ahead of time to define "driving too fast" as exceeding the speed limit by more than 5 miles per hour). To produce a random sample, he rolls a die and only includes a car in his sample if he rolls a 5 or a 6. He finds that 18 of 28 red cars are driving too fast, and 75 of 205 other cars are driving too fast.

   (a) Is this convincing evidence that people who drive red cars are more likely to drive too fast, as the policemen has defined it? 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 red cars that drove too fast and other cars that drive too fast.

Quiz 10.2A AP Statistics Name:

1. 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 $\alpha = 0.05$.

Quiz 10.2B AP Statistics Name:

1. Jordan's cat "Fern" is a finicky eater. Jordan is trying to determine which of two brands of canned cat food Fern prefers, Tab-a-Cat or Chow Lion. For two months, she flips a coin each day to decide which of the two foods to feed Fern, and weighs how much Fern eats in grams. Here is the data:

	n	$\bar{x}$	s
Tab-a-Cat	31	85.2	3.45
Chow Lion	30	82.1	4.62

(a) Find the standard error for the difference in the mean amount of Tab-a-Cat that Fern eats and the mean amount of Chow Lion she eats.

(b) Construct and interpret a 99% confidence interval for the difference in mean amount of food Fern eats when she is offered Tab-a-Cat and when she is offered Chow Lion.

(c) Suppose we want to test the hypothesis that the mean amount of Tab-a-Cat Fern eats is higher than the mean amount of Chow Lion she eats. State the null and alternative hypotheses for this test.

(d) The test statistic is $t = 2.962$. Determine the P-value and draw an appropriate conclusion, using $\alpha = 0.01$.