AP Statistics   Name _____
Ch. 10 Comparing Two Proportions

1. A researcher reports that 80% of high school graduates, but only 40% of high school drop outs, would pass a basic literacy test. Assume that the researcher's claim is true. Suppose we give a basic literacy test to a random sample of 60 high school graduates and a separate random sample of 75 high school dropouts. Let $\hat{p}_g$ and $\hat{p}_d$ be the sample proportions of graduates and dropouts, respectively, who pass the test.

a. What is the shape of the sampling distribution of $\hat{p}_g - \hat{p}_d$? And Why?

b. Find the mean and standard deviation of the sampling distribution.

2. Nathan and Kyle both work for the Department of Motor Vehicles (DMV), but they live in different states. In Nathan's state, 80% of the registered cars are made by American manufacturers. In Kyle's state, only 60% of the registered cars are made by American manufacturers. Nathan selects a random sample of 100 cars in his state and Kyle selects a random sample of 70 cars in his state. Let $\hat{p}_N - \hat{p}_K$ be the difference in the sample proportion of cars made by American manufacturers.

a. What is the shape of the sampling distribution of $\hat{p}_N - \hat{p}_K$? Why?

b. Find the mean and standard deviation of the sampling distribution.

3. Many news organizations conduct polls asking adults in the United States if they approve of the job the president is doing. How did President Obama's approval rating change from October 2012 to October 2013? According to a Gallup poll of 1500 randomly selected U.S. adults on October 2–4, 2012, 52% approved of Obama's job performance. A Gallup poll of 1500 randomly selected U.S. adults on October 5–7, 2013, showed that 46% approved of Obama's job performance.

a. Calculate the standard error of the sampling distribution of the difference in the sample proportions (2013 – 2012). Interpret this value.

b. Use the results of these polls to construct and interpret a 90% confidence interval for the change in Obama's approval rating among all U.S. adults from October 2012 to October 2013.

c. Based on your interval, is there convincing evidence that Obama's job approval rating has changed?

4. Is rap music more popular among young blacks than among young whites? A sample survey compared 634 randomly chosen blacks aged 15 to 25 with 567 randomly selected whites in the same age group. It found that 368 of the blacks and 130 or the whites listened to rap music every day.

Construct and interpret a 95% confidence interval for the difference between the proportion of black and white young people who listen to rap every day.