Quiz 7.2B AP Statistics Name:

1. According to a poll, 22% of high school students in the United Kingdom say that Dobby is their favorite character in the Harry Potter books. Let's assume this is the parameter value for the entire population of high school students in the U.K. You take a sample of 150 high school students and record the proportion, $\hat{p}$, of individuals in your sample who say Dobby is their favorite character.

(a) What are the mean and standard deviation of the sampling distribution of $\hat{p}$?

(b) What is the approximate shape of the sampling distribution? Justify your answer.

(c) Suppose our sample size was 36 instead of 150. Compare the shape, center, and spread of this sampling distribution to the one in parts (a) and (b).

(d) A small town in the U.K. has only 600 high school students. What is the largest possible sample you can take from this town and still be able to calculate the standard deviation of the sampling distribution of $\hat{p}$ using the method presented in the textbook? Explain.

2. Power companies severely trim trees growing near their lines to avoid power failures due to falling limbs in storms. Applying a chemical to slow the growth of the trees is cheaper than trimming, but the chemical kills some of the trees. Suppose that one such chemical would kill 20% of sycamore trees. The power company tests the chemical on 250 sycamores. Consider these an SRS from the population of all sycamore trees.

(a) What are the mean and standard deviation of the proportion of trees that are killed in samples of 250 trees?

(b) Calculate probability that at least 24% of the trees in the sample are killed.