1) A family of mutual funds maintains a service that allows clients to switch money among accounts through a telephone call. It was estimated that 3.2% of callers either get a busy signal or are kept on hold so long that that they may hang up. Fund management assesses any failure of this sort as a $10 goodwill loss. Suppose that 2,000 calls are attempted over a particular period.

a) Find the mean and standard deviation of the number of callers who will either get a busy signal or may hang up after being kept on hold.

b) Find the mean and standard deviation of the total goodwill loss to the mutual fund company from these 2,000 calls.

2) Financial Managers Inc. buys and sells a large number of stocks routinely for the various accounts that it manages. Portfolio manager Sandra Cruz has asked for your assistance in the analysis of the Burde Fund. A portion of this portfolio consists of 10 shares of stock A and 8 shares of stock B. The price of A has a mean of 12 and a variance of 14, while the price of B has a mean of 10 and a variance of 12. The correlation between prices is 0.5.

a) What is the mean and variance of the portfolio value?

b) Sarah has been asked to reduce the variance (risk) of the portfolio. She offers to trade the 10 shares of stock A and receives two offers from which she can select one: 10 shares of stock 1 with a mean price of 12, a variance of 25, and a correlation with the price of stock B equal to – 0.2; or 10 shares of stock 2 with a mean price of 10, a variance of 9, and a correlation with the price of stock B, equal to +0.5. Which offer should she select?

3)The number of hours spent studying by students on a large campus in the week before final exams follows a normal distribution with a standard deviation of 8.4 hours. A random sample of these students is taken to estimate the population mean number of hours studying.

a) How large of a sample is needed to ensure that the probability that the sample mean differs from the population mean by more than 2.0 hours is less than 0.05.

b) Without doing the calculations, state whether a larger or smaller sample size compared to the sample size in part (a) would be required to guarantee that the probability of the sample mean differing from the population mean by more than 2.0 hours is less than 0.10.

c) Without doing the calculations, state whether a larger or smaller sample size compared to the sample size in part (a) would be required to guarantee that the probability of the sample mean differing from the population mean by more than 1.5 hours is less than 0.05.

4) Forty percent of students at small colleges have brought their own personal computers to campus. A random sample of 120 entering freshmen was taken.

a) What is the standard error of the sample proportion bringing their own personal computers to campus?

b) What is the probability that the sample proportion is less than 0.33?

c) What is the probability that the sample proportion is between 0.38 and 0.46?