

DO THE PROBLEMS ON THE BACK OR ATTACH A SEPARATE SHEET OF PAPER WITH YOUR WORK.

1. According to a market research firm, 52% of all residential telephone numbers in Los Angeles are unlisted. A telemarketing company uses random digit dialing equipment that dials residential numbers at random, regardless of whether they are listed in the telephone directory. The firm calls 500 numbers in Los Angeles.
 - a. Describe the sampling distribution model for this situation. What is its shape? What are the mean and standard deviation?
 - b. Draw and label this model according to the 68-95-99.7 rule.
 - c. Check the necessary conditions to make sure the model can be used in this situation.
 - d. Find the probability that at least half (50%) of the numbers the firm calls are unlisted.
2. According to Management Recruiters International, 28.7% of professionals in the U.S. work late (beyond their scheduled hours) at least 3 days per week. A survey is conducted of 250 randomly selected professionals in the banking industry to see if they work at least 3 days per week.
 - a. Check the necessary conditions to make sure the Normal model can be used in this situation.
 - b. Assuming bankers follow the same working pattern as other professionals, draw and label this model according to the 68-95-99.7 rule.
 - c. If our survey found that 26% of the bankers surveyed work late at least 3 days a week, would this result lead you to believe that bankers are different from other professionals? (Use your drawing from part (a) to answer)
 - d. Find the probability that less than 21% of those surveyed work late more than 3 days per week.
 - e. Find the probability that more than 35% of those surveyed work late more than 3 days per week.
3. The Gallup Poll asked a random sample of 1540 adults, "Do you happen to jog?" Suppose that in fact 15% of all adults jog.
 - a. Do the appropriate conditions appear to be met to use the Normal model for this problem? Explain.
 - b. Find the probability that between 14% and 17% of the sample jog.
4. The Gallup Poll asked a random sample of 1785 adults whether they attended religious services during the past week. Suppose that 40% of the adult population did attend. What is the probability that the survey will be within $\pm 3\%$ of the true proportion? (In other words, what is the probability that the sample will be between 37% and 43%?)