

4.61 Find a value for z , say z_0 , such that $P(z > z_0) = .0089$.

4.69 Records maintained by the office of budget in a particular state indicate that the amount of time elapsed between the submission of travel vouchers and the final reimbursement of funds has approximately a normal distribution with a mean of 39 days and a standard deviation of 6 days.

- What is the probability that the elapsed time between submission and reimbursement will exceed 50 days?
- If you had a travel voucher submitted more than 55 days ago, what might you conclude?

4.73 City officials want to sample the opinions of the homeowners in a community regarding the desirability of increasing local taxes to improve the quality of the public schools. If a random number table is used to identify the homes to be sampled and a home is discarded if the homeowner is not home when visited by the interviewer, is it likely this process will approximate random sampling? Explain.

4.77 A random sample of 16 measurements is drawn from a population with a mean of 60 and a standard deviation of 5. Describe the sampling distribution of \bar{y} , the sample mean. Within what interval would you expect \bar{y} to lie approximately 95% of the time?

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4.83 The level of a particular pollutant, nitrogen oxide, in the exhaust of a hypothetical model of car, the Polluter, when driven in city traffic has approximately a normal distribution with a mean level of 2.1 grams per mile (g/m) and a standard deviation of 0.3 g/m.

- If the EPA mandates that a nitrogen oxide level of 2.7 g/m cannot be exceeded, what proportion of Polluters would be in violation of the mandate?
- At most, 25% of Polluters exceed what nitrogen oxide level value (that is, find the 75th percentile)?
- The company producing the Polluter must reduce the nitrogen oxide level so that at most 5% of its cars exceed the EPA level of 2.7 g/m. If the standard deviation remains 0.3 g/m, to what value must the mean level be reduced so that at most 5% of Polluters would exceed 2.7 g/m?

4.84 Refer to Exercise 4.83. A company has a fleet of 150 Polluters used by its sales staff. Describe the distribution of the total amount, in g/m, of nitrogen oxide produced in the exhaust of this fleet. What are the mean and standard deviation of the total amount, in g/m, of nitrogen oxide in the exhaust for the fleet? (*Hint:* The total amount of nitrogen oxide can be represented as $\sum_{i=1}^{150} W_i$, where W_i is the amount of nitrogen oxide in the exhaust of the i th car. Thus, the Central Limit Theorem for sums is applicable.)