

Sample Final Exam

Problem 1. If 7 different customers arrive for service in random order, what is the probability that they will be in alphabetical order.

Problem 2. For families with 4 children, assume that girls and boys are equally likely. Find the probability of having 0, 1, 2, 3, and 4 girls, and summarize the results in the form of a probability table. Compute the mean and standard deviation. If for a certain family you find that they have 4 boys, can this result be considered unusual?

Problem 3.

(a) The weights of women aged 18 to 24 are normally distributed with a mean of 132 lb and a standard deviation of 27.4 lb. If 150 women 18 to 24 years old are randomly selected, how many of them are expected to weigh between 100 lb and 150 lb?

(b) A study of VCR owners found that their annual household incomes are normally distributed with a mean of \$41,182, and a standard deviation of \$19,990. If an advertising campaign is to be targeted at those VCR owners whose household incomes are in the top 90%, find the minimum income level for this target group.

Problem 4.

(a) An aircraft manufacturer randomly selects 12 planes of the same model and tests them to determine the distance they require for takeoff. The sample mean and standard deviation are computed to be 524 m and 23 m respectively. At the 0.05 significance level, test the claim that the mean for all such planes is more than 500 m.

(b) A sample of beer cans labeled 16 oz is randomly selected and the actual contents accurately measured. The results (in ounces) are as follows. Is the consumer being cheated?

15.8 16.2 16.3 15.9 15.5

15.9 16.0 15.6 15.8

Problem 5.

(a) A study by the Environmental Protection Agency led to the claim that 4.4% of the catalytic converter are removed from cars originally installed with them. Test this claim if a study of 200 cars built with catalytic converters reveals that 8.0% of them were removed. Use a 0.01 significance level.

(b) What sample size is required to have a 99% confidence margin of error of at most 3%?