**Find the indicated probability.**

1) A bank's loan officer rates applicants for credit. The ratings are normally distributed with a mean of 200 and a standard deviation of 50. If an applicant is randomly selected, find the probability of a rating that is between 170and 220.

**Solve the problem**

2) For women aged 18-24, systolic blood pressures (in mm Hg) are normally distributed with a mean of 114.8 and a standard deviation of 13.1. If 23 women aged 18-24 are randomly selected, find the probability that their mean systolic blood pressure is between 119 and 122.

**Use the confidence level and sample data to find a confidence interval for estimating the population µ.**

3) A random sample of 7 9 light bulbs had a mean life of x= 400 hours with a standard deviation of Η = 2 8 hours. Construct a 90 percent confidence interval for the mean life, µ, of all light bulbs of this type.

**Use the given degree of confidence and sample data to construct a confidence interval for the population mean µ. Assume that the population has a normal distribution.**

4) A sociologist develops a test to measure attitudes about public transportation, and 27 randomly selected subjects are given the test. Their mean score is 76.2 and their standard deviation is 21.4. Construct the 95% confidence interval for the mean score of all such subjects.

**Identify the null hypothesis, alternative hypothesis, test statistic, P-value, conclusion about the null hypothesis, and final conclusion that addresses the original claim.**

5) Various temperature measurements are recorded at different times for a particular city. The mean of 2 0°C is obtained for 4 0 temperatures on 4 0 different days. Assuming that Η = 1.5°C, test the claim that the population mean is 2 3°C. Use a 0.05 significance level.

**Test the given claim using the traditional method of hypothesis testing. Assume that the sample has been randomly selected from a population with a normal distribution.**

6) A test of sobriety involves measuring the subject's motor skills. Twenty randomly selected sober subjects take the test and produce a mean score of 41.0 with a standard deviation of 3.7. At the 0.01 level of significance, test the claim that the true mean score for all sober subjects is equal to 35.0.

**Construct the indicated confidence interval for the difference between the two population means. Assume that the two samples are independent and that they have been randomly selected.**

7) Two types of flares are tested for their burning times (in minutes) and sample results are given below

Brand X Brand Y

n = 35 n = 40

x= 19.4 x= 15.1

s = 1.4 s = 0.8

Construct a 95% confidence interval for the differences µX - µY based on the sample data.

**Use the traditional method of hypothesis testing to test the given claim about the means of two populations. Assume that two dependent samples have been randomly selected from normally distributed populations.**

8) The table below shows the weights of seven subjects before and after following a particular diet for two months.

Subject A B C D E F G

Before 157 160 156 183 190 157 161

After 150 151 154 188 176 159 149

Using a 0.01 level of significance, test the claim that the diet is effective in reducing weight.

**Find the value of the linear correlation coefficient r**

9) A study was conducted to compare the average time spent in the lab each week versus course grade for computer students. The results are recorded in the table below.

Number of hours spent in lab Grade (percent)

1 0 9 6

1 1 5 1

1 6 6 2

9 5 8

7 8 9

1 5 8 1

1 6 4 6

1 0 5 1

**Find the best predicted value of y corresponding to the given value of x**

10) The regression equation relating dexterity scores (x) and productivity scores (y) for the employees of a company is ŷ=5.50 + 1.91x. Ten pairs of data were used to obtain the equation. The same data yield r= 0.986 and y-(y-bar­) = 56.3.

What is the best predicted productivity score for a person whose dexterity score is 33?

**Use the given information to find the coefficient of determination.**

11) The test scores of 6 randomly picked students and the numbers of hours they prepared are as follows:

Hours 5 ,10, 4, 6, 10, 9

The equation of the regression line is ŷ = 1.06604x + 67.3491. Find the coefficient of determination7

**Perform the indicated goodness-o f-fit test**

12) Use a significance level of 0.01 to test the claim that workplace accidents are distributed on workdays as follows:

Monday 25%, Tuesday: 15%, Wednesday: 15%, Thursday: 15%, and Friday: 30%. In a study of 100 workplace accidents, 2 3 occurred on a Monday, 1 2 occurred on a Tuesday, 1 2 occurred on a Wednesday, 1 8 occurred on a Thursday, and 3 5 occurred on a Friday.

13) You roll a die 48 times with the following results.

Number: 1, 2, 3, 4, 5, 6

Frequency: 14, 4, 2, 1, 12, 15

Use a significance level of 0.05 to test the claim that the die is fair.

**Use a χ² test to test the claim that in the given contingency table, the row variable and the column variable are independent.**

14) Use the sample data below to test whether car color affects the likelihood of being in an accident. Use a significance level of 0.01.

|  |  |  |  |
| --- | --- | --- | --- |
| Car has been in accident  Car has not been  in accident | Red | Blue | White |
| 28  23 | 33  22 | 36  30 |

**Test the claim that the samples come from populations with the same mean. Assume that the populations are normally distributed with the same variance.**

15) The data below represent the weight losses for people on three different exercise programs.

|  |  |  |
| --- | --- | --- |
| Exercise A | Exercise B | Exercise C |
| 2.5  8.8  7.3  9.8  5.1 | 5.8  4.9  1.1  7.8  1.2 | 4.3  6.2  5.8  8.1  7.9 |

At the 1% significance level, does it appear that a difference exists in the true mean weight loss produced by the three exercise programs?