5. At a school pep rally, a group of sophomore students organized a free raffle for prizes. They claimed that they put the names of all the students in the school in the basket and that they randomly drew 36 names out of this basket. Of the prize winners, 6 were freshmen, 14 were sophomores, 9 were juniors, and 7 were seniors. The results do not seem that random to you. You think it is a little fishy that sophomores organized the raffle and also won the most prizes. Your school is composed of 30% freshmen, 25% sophomores, 25% juniors, and 20% seniors.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Freshmen** | **Sophomores** | **Juniors** | **Seniors** | **Totals** |
| **Observed** | 6 | 14 | 9 | 7 |  |
| **Expected** |  |  |  |  |  |
| **Chi-Square** |  |  |  |  |  |

a. What are the expected frequencies of winners from each class?

b. Conduct a significance test to determine whether the winners of the prizes were distributed throughout the classes as would be expected based on the percentage of students in each group. Report your Chi Square and p values.

c. what do you conclude?

Assume the significance level is 0.05.

14. A geologist collects hand-specimen sized pieces of limestone from a particular

area. A qualitative assessment of both texture and color is made with the following results. Is there evidence of association between color and texture for these limestones? Explain your answer.

|  |  |
| --- | --- |
|  | **Color** |
| **Texture** | **Light** | **Medium** | **Dark** |
| Fine | 4  | 20  | 8 |
| Medium | 5  | 23  | 12 |
| Coarse | 21 | 23 | 4 |

102. Do men and women select different breakfasts? The breakfasts ordered by randomly selected men and women at a popular breakfast place is shown in **Table 11.55**. Conduct a test for homogeneity at a 5% level of significance.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **French Toast** | **Pancakes** | **Waffles** | **Omelettes** |
| **Men** | 47 | 35 | 28 | 53 |
| **Women** | 65  | 59 | 55 | 60 |

82.

|  |  |  |
| --- | --- | --- |
| Size (ounces) | Cost ($) | Cost per ounce |
| 16 | 3.99 |  |
| 32 | 4.99 |  |
| 64 | 5.99 |  |
| 200 | 10.99 |  |

a. Using “size” as the independent variable and “cost” as the dependent variable, draw a scatter plot.

b. Does it appear from inspection that there is a relationship between the variables? Why or why not?

c. Calculate the least-squares line. Put the equation in the form of: *ŷ* = *a* + *bx*

d. Find the correlation coefficient. Is it significant?

e. If the laundry detergent were sold in a 40-ounce size, find the estimated cost.

f. If the laundry detergent were sold in a 90-ounce size, find the estimated cost.

g. Does it appear that a line is the best way to fit the data? Why or why not?

h. Are there any outliers in the given data?

i. Is the least-squares line valid for predicting what a 300-ounce size of the laundry detergent would you cost? Why or why not?

j. What is the slope of the least-squares (best-fit) line? Interpret the slope.