1. Is the type of beverage ordered with lunch at a restaurant independent of the age of the consumer? A random poll of 309 lunch customers is taken, resulting in the following contingency table of observed values. Use 1 percent significance level to determine whether the two variables are independent.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Preferred beverage** | | |
| **Age** | Coffee/tea | Soft drink | Milk |
| 21 – 34 | 26 | 95 | 18 |
| 35 – 55 | 41 | 40 | 20 |
| Above 55 | 24 | 13 | 32 |

1. Use the following contingency table and the chi-square test of independence to determine whether social class is independent of number of children in a family. Use 5 percent significance level

|  |  |  |  |
| --- | --- | --- | --- |
|  | Social class | | |
| Number of children | Lower | Middle | Upper |
| 0 | 7 | 18 | 6 |
| 1 | 9 | 38 | 23 |
| 2 to 3 | 34 | 97 | 58 |
| Above 3 | 47 | 31 | 30 |

1. Is the transportation mode used to ship goods is independent of type of industry? Suppose the following contingency table represents frequency counts of types of transportation used by the publishing and the computer hardware industries. Analyze the data by using the chi-square test of independence to determine whether type of industry is independent of transportation mode. Use 5% level of significance.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Transportation | | |
|  |  | Air | Train | Truck |
| Industry | Publishing | 32 | 12 | 41 |
| Computer hardware | 5 | 6 | 24 |

1. A study was conducted to determine the impact of major Mexican peso devaluation on U.S. border retailers. As a part of the study, data were gathered on the magnitude of business that U.S border retailers were doing with Mexican citizens. Forty-one shoppers of border city department stores were interviewed; 24 were Mexican citizens, and the rest were U.S. citizens. Thirty five discount store shoppers were interviewed, as were 30 hardware store and 60 shoe store customers. In these three groups, 20, 11, and 32 were Mexican, and the remaining shoppers were U.S. citizens. Use Chi-Square contingency analysis to determine whether the shoppers’ citizenship (Mexican versus American) is independent of type of border city retailer (department, discount, hardware, and shoe) for these data. Use 5 percent significance level.