Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit 1: Statistics Test Review

1. Find the mean, median class, and modal class of the data below

|  |  |
| --- | --- |
| Class Boundaries | Frequency |
| 3.5-6.5 | 8 |
| 6.5-9.5 | 9 |
| 9.5-12.5 | 3 |
| 12.5-15.5 | 7 |
| 15.5-18.5 | 9 |

Mean:

Median Class:

Modal Class:

2. Construct a cumulative frequency graph and histogram on the same grid below.

32, 47, 42, 34, 35, 41, 42, 36, 31, 32, 48, 46, 34, 40, 38, 25, 35, 23, 37, 28

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Class | Class Boundaries | Tally  | Frequency | Cumulative Frequency |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |



2. Continued

What is the modal class of data?

What is the median class of the data?

3. A ballpoint pen manufacturer suggests that the distance their pens will write is normally distributed with a mean of 2500 meters and a standard deviation of 200 meters.

a. What percent of the company’s pens last for:

 i. Less than 2100 meters ii. More than 2300 meters iii. Between 2000 and 3000 meters

b. The manager of the company wishes to claim that 90% of the pens can write more than x meters. What should the value of x be?

c. If 1000 pens are sold by a local store, what is the expected number of pens that will last less than 2000 meters?

4. The student constructed a table showing the number of visitors entering the museum and the number of hours of sunlight for that particular day.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Hours of Sunlight | 2 | 3 | 4 | 7 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Number of Visitors | 7 | 8 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 5 | 6 | 4 | 4 |

a. On the grid below, construct the scatter plot for this data. Use the scale of 1 cm on the horizontal axis to represent 2 hour and 1 cm on the vertical axis to represent 2 visitor).

b. What is the correlation value between the hours of sunlight and the number of visitors? What type of correlation is this?

c. Determine the mean point and the line of best fit.

4. Continued



5. Charles noticed there seemed to be a connection between the kinds of movies high school students enjoy and the types of extra-curricular activities they participate in. He randomly collected data to test the hypothesis that they extra-curricular activities a student participated in is dependent on movie genre. The data was tabulated and organized as shown below.

|  |
| --- |
| Extra-curricular Activity |
| Visual Arts | Sports | Performing Arts | Community Service |
| Movie | Comedy | 10 | 21 | 11 | 15 |
| Romance | 17 | 2 | 17 | 3 |
| Action | 3 | 15 | 2 | 6 |

Write the null and alternative hypothesis

H0:

H1:

5. Continued

Determine if there is enough evidence to accept or reject the null hypothesis for α = 0.05.

Conclusion:



6. The box-and-whisker diagram below shows the statistics for a set of data.

a: Write down the value of each of the following: [4 marks]

* Median:
* Upper Quartile:
* Minimum Value:
* Interquartile Range:
* b: A second box-and-whisker diagram is to be drawn on the same grid. The following information is known about the data for this box-and-whisker diagram: the range is 10, the minimum value is 18, the interquartile range is 6, the lower quartile is 19.5, and the median is 23. [2 marks]

7. A school offers 4 subjects from the IB Diploma Group 3. These are business management, economics, history, and psychology. The number of students choosing each subject by gender is given below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Business Management** | **Economics** | **History** | **Psychology** |
| **Male** | **27** | **15** | **7** | **14** |
| **Female** | **13** | **7** | **15** | **11** |

A $X^{2}$ (chi-squared) test at the 5% significance level is used to determine whether the choice of subject is independent of gender.

a. What is the total number of person in the sample and how many males and female were there in the sample? [3 marks]

b. Show that the expected frequency for females choosing economics is 9.2844. [3 marks]

c. Write down the contingency table for the expected frequencies. [4 marks]

d. Write down the p-value for the test. [2 marks]

e. State whether the null hypothesis is accepted or rejected. Give a reason for your answer. [3 marks]

8. Weights of 00 apples, in grams, from an orchard were recorded

|  |  |  |
| --- | --- | --- |
| Weight of Apples (g) | Number of Apples | Cumulative Frequency |
| $$110\leq x<115$$ | 13 | 13 |
| $$115\leq x<120$$ | 14 | 27 |
| $$120\leq x<125$$ | 18 | 45 |
| $$125\leq x<130$$ | 22 | p |
| $$130\leq x<135$$ | 17 | 84 |
| $$135\leq x<140$$ | 10 | 94 |
| $$140\leq x<145$$ | 5 | 99 |
| $$145\leq x<150$$ | 1 | 100 |

a. Write down the missing value p in the cumulative frequency column. [1 mark]

b. Using the table, find the following information: [3 marks]

* Median:
* Lower Quartile:
* Upper Quartile:

c. Draw a box-and-whisker diagram to represent the information. [2 marks]