**1.** (8 pts) Showing your work, Find the median of the following data.

86 92 76 66 27 59 74 86 48

**2.** (18 pts) The mileages of 24 cars were compiled (in miles per gallons):

37 18 22 41 18 28 27 40

24 20 28 29 19 36 20 26

42 36 44 32 30 37 29 35

Summarize the data by constructing **a frequency distribution** and a **relative frequency distribution**, using intervals shown below. (**Fill in the table**.)

|  |  |  |
| --- | --- | --- |
| **Mileage (miles per gallon)** | **Frequency** | **Relative Frequency**  **(to the nearest thousandth)** |
| **14.5 – 19.5** |  |  |
| **19.5 – 24.5** |  |  |
| **24.5 – 29.5** |  |  |
| **29.5 – 34.5** |  |  |
| **34.5 – 39.5** |  |  |
| **39.5 – 44.5** |  |  |
| Total |  |  |

**3.** (12 points) In a consulting firm, in addition to its president, who is the chief executive officer (CEO), two engineers, a scientist, and an administrative assistant are on the payroll; the mean annual salary is $120,000. The CEO decides to expand the firm’s services to its clients and hires a consultant and a scientist with the annual salaries of $100,000 and $80,000, respectively. Showing your work determine what the mean annual salary for the expanded firm is.

**4.** (8 pts) Consider the following table and pie graph (pie chart) before answering the question.

Assume that the values in the given table are correct.

**Major Number %**

**of Seniors of Seniors**

Business 633 33

Computer Sci. 194 10

English 236 12

Biology 134 7

Psychology 40 2

Other majors 681 36

Total Number

of Seniors 1918 100



Which of the following best describes the **most serious** problem with the pie chart?

(no explanation required) 3. \_\_\_\_\_\_\_

A. The sizes of the pie wedges are incorrect because the business wedge is too large and the English wedge is too small.

B. The numbers shown in the pie chart for the selected majors do not match the numbers in the % column of the table for those selected majors.

C. The numbers in the pie chart should be followed by “%” because the values are percentages.

D. The sizes of all the pie wedges are incorrect because an additional wedge must be included.

**5.** (32 pts) The number of calories per hot dog was determined for 10 brands of poultry hot dogs. The data are

177 101 157 102 138 152 104 91 104 164

(a) Find the **median**. **Show some work/explanation**. **Do not forget the unit**.

(b) State the **mode(s) with unit(s)**.

(c) Compute the **sample mean**, the **sample variance**, and the **sample standard deviation**.

Use the table below to help organize your work. **Fill in the table.**

|  |  |  |
| --- | --- | --- |
| *xi* |  |  |
| 177 |  |  |
| 101 |  |  |
| 157 |  |  |
| 102 |  |  |
| 138 |  |  |
| 152 |  |  |
| 104 |  |  |
| 91 |  |  |
| 104 |  |  |
| 164 |  |  |
| **Total:**  **\_\_\_\_\_** | **Total:**  **\_\_\_\_\_** | **Total:**  **\_\_\_\_\_\_** |

**Mean = \_\_\_\_\_\_\_\_\_\_\_\_\_**

**Sample Variance = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Standard Deviation****= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

(d) What percentage of the data fall within one standard deviation of the mean? **Show work/explanation.**

**6.** (22 pts) At a university, the probability that a student brings a laptop computer (laptop) to classes is 0.65. Five students from that university are selected at random. (Report answers rounded to four decimal places. **Show work.**)

(a) What is the probability that **exactly two** of the five students bring laptops to classes?

**Show work.**

(b) What is the probability that **none** of the five students brings a laptop to classes?

**Show some work/explanation.**

(c) What is the probability that **at most one** of the five the students bring laptops to classes?

**Show some work/explanation.**

(d) What is the probability that **at least one** of the five students brings a laptop to classes?

**Show some work/explanation.**