

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_ Student ID: \_\_\_\_\_

### Chapter 5: Measures of Central Tendency, Measures of Spread

1. An interviewer rates candidates out of 5 for each of three criteria: experience, education, and interview performance. If the first two criteria are each weighted twice as much as the interview, determine which of the following candidates should get the job.

Criterion	Nadia	Enzo	Stephan
Experience	4	5	5
Education	4	4	3
Interview	4	3	4

2. The following table shows the salary structure of Plush Toys, Inc. Assume that salaries exactly on an interval boundary have been placed in the higher interval.

Salary Range (\$1000)	Number of Employees
20-30	12
30-40	24
40-50	32
50-60	19
60-70	9
70-80	3
80-90	0
90-100	1

- Determine the approximate mean salary for an employee of this firm.
- Determine the approximate median salary.
- How much does the outlier influence the mean and median salaries?

3. A group of friends and relatives get together every Sunday for a little pick-up hockey. The ages of the 30 regulars are shown below.

22	28	32	45	48	19	20	52	50	21
30	46	21	38	45	49	18	25	23	46
51	24	39	48	28	20	50	33	17	48

- Determine the mean, median, and mode for this data set.
- Which measure best describes these data? Explain your choice.
- Group these data into six intervals and produce a frequency table.
- Produce a cumulative-frequency diagram.
- Determine the approximate mean, median and mode for the grouped data.

4. Determine the mean, standard deviation, and variance for the following samples.

- a) Scores on a chemistry quiz (out of 10 with a bonus question):

5	7	9	6	5	10	8	2
11	8	7	7	6	9	5	8

- b) Costs for books purchased including taxes (in dollars):

12.55 15.31 21.98 45.35 19.81 33.89 29.53 30.19 38.20

5. a) Show that the sample standard deviation  $s = \sqrt{\frac{n(\sum x^2) - (\sum x)^2}{n(n-1)}}$ .

- b) What are two advantages of using the formulae in part a) for calculating standard deviation?

6. Determine the median,  $Q1$ ,  $Q3$ , the interquartile range, and semi-interquartile range for the following sets of data.

- a) Number of home runs hit by players on the Willowwood league team:

6 4 3 8 9 11 6 5 15

- b) Final grades in a geography class:

88 56 72 67 59 48 81 62  
90 75 75 43 71 64 78 84

7. The board members of a provincial organization receive a car allowance for travel to meetings. Here are the distances the board logged last year (in kilometres).

44	18	125	80	63	42	35	68	52
75	260	96	110	72	51			

- Determine the mean, standard deviation, and variance for these data.
- Determine the median, interquartile range, and semi-interquartile range.
- Illustrate these data using a box-and-whisker plot.
- Identify any outliers.

8. A business travellers' association rates hotels on a variety of factors including price, cleanliness, services, and amenities to produce an overall score out of 100 for each hotel. Here are the ratings for 50 hotels in a major city.

39	50	56	60	65	68	73	77	81	87
41	50	56	60	65	68	74	78	81	89
42	51	57	60	66	70	74	78	84	91
44	53	58	62	67	71	75	79	85	94
48	55	59	63	68	73	76	80	86	96

- What score represents i) the 50th percentile? ii) the 95th percentile?
- What percentile corresponds to a rating of 50?
- The travellers' association lists hotels above the 90th percentile as "highly recommended" and hotels between the 75th and 90th percentiles as "recommended." What are the minimum scores for the two levels of recommended hotels?