



Student No.:	Date: / /	Score: /32
Student Name:		

Revision of More about Dispersion (I)

Exercises

[In this exercise, (i) give the answers correct to 3 significant figures if necessary; (ii) unless otherwise stated, assume that in a normal distribution, 68%, 95% and 99.7% of the data lie within one, two and three standard deviations respectively from the mean.]

- 6 students participate in a general questions' contest and their scores are as follows.
76, 74, 75, 97, 72, 86
 - Find the mean and the standard deviation of the scores.
 - Covert the scores into standard scores.
- The standard deviation of the data set $\{e, f, g, h\}$ is σ . Find the standard deviation of the data set $\{7e+6, 7f+6, 7g+6, 7h+6\}$.
- The scores of 3000 candidates in the public examination are normally distributed. The mean and the standard deviation of the score are 56 and 7.1 respectively.
 - How many candidates scored more than 41.8?
 - If the passing rate of this examination is 84%, how many candidates have passed and what is the minimum score of passing the examination?
- The mean and the standard deviation of the score in a test are 66 and 8.6 respectively. The score of Alfred is 70.
 - Find the standard score of Alfred in the test.
 - If the mean and the standard deviation of the scores become 58 and 7.5 respectively after an adjustment, but the standard score of each student remains unchanged, find the new score of Alfred after the adjustment.

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5. The following table shows the distribution of the ages of a group of students.

Age	12	13	14	15	16	17
Frequency	10	8	8	10	5	9

- (a) Find the range and the inter-quartile range of the ages.
(b) Find the standard deviation of the ages.
(c) Find the range, the inter-quartile range and the standard deviation of the ages of this group of students 2 years later.

6. The following table shows the number of computers sold by a group of staff last month.

Number of computers	35	36	37	38	39	40	41	42
Frequency	7	2	5	2	7	9	5	3

- (a) How many staff were there?
(b) Find the mean and the standard deviation of the computer sold.
(c) A bonus of \$400 is awarded to the staff if he sells one computer. Find the mean and the standard deviation of the bonuses.

7. The scores of 200 students in Mathematics examination are normally distributed with mean 59 and the standard deviation of 6.

- (a) If 16% of the students fail in the examination, what is the passing mark?
(b) If a student gets mark in the range 47 to 53, then grade E will be given. Find the number of students who score grade E.

8. The batteries inside the mobile phone have their own maximum calling times. A factory produces 600 batteries with the mean of maximum calling time 780 minutes and the standard deviation 26.2 minutes. How many batteries can have the maximum calling time

- (a) less than 727.6 minutes?
(b) longer than 753.8 minutes?
(c) between 753.8 minutes and 832.4 minutes?

9. The means and the standard deviations of the marks in the mid-term tests for the whole class in three subjects are shown in the following table.

	Biology	History	Liberal Studies
Mean	62.0	54.4	81.1
Standard deviation	4.1	9	5.8

Given that Becky's mark in Biology and Liberal Studies are 69 and 82.6 respectively. Her standard score for the mark in History was 0.6.

- Find Becky's mark for History.
- Find her standard scores in Biology and Liberal Studies.
- Which subject did she perform the best?

10. Assume that the heights of maple trees in a forest are normally distributed with the mean 4.3 m and the standard deviation is 0.4 m.
- Find the percentage of maple trees with heights
 - between 3.5 m and 5.5 m,
 - higher than 3.9 m.
 - If there are 7480 maple trees with heights between 3.9 m and 4.7 m, how many maple trees are shorter than 3.5 m?

11. The following are the bonuses (in \$) of 11 salespersons in a company this month.

2500 6200 9500 8700 2800 8400
 2200 8500 5400 4700 4900

- Find the range and the inter-quartile range.
- Find the mean and the standard deviation. (*Give the answers correct to the nearest integer.*)
- Find the new means and the new standard deviations for each of the following situations. (*Give the answers correct to the nearest integer.*)
 - The lowest and the highest bonuses are removed.
 - The lower quartile and the upper quartile are removed.

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M.C.

1. Florence scored 89 marks in a Mathematics test and her standard score is 0.6. If the mean of the test is 86, and if Benny scored 71 marks in the same test, find his standard score.

- A. -0.5
- B. -1
- C. -2
- D. -3

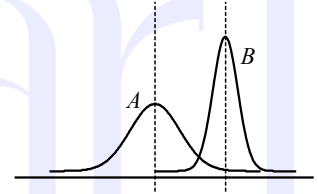
2. If each datum of a set of data is increased by 3.6, which of the following statements is/are correct?

- I. The median is increased by 3.6.
- II. The range is increased by 3.6
- III. The inter-quartile range is increased by 3.6.

- A. I only
- B. I & II only
- C. II & III only
- D. I, II & III

3. The figure shows the normal curves of two normal distributions A and B . Which of the following must be true?

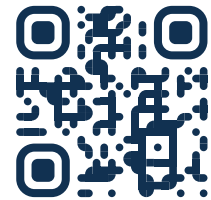
- I. Median of $A < \text{Median of } B$
- II. Mode of $A < \text{Mode of } B$
- III. Range of $A < \text{Range of } B$



- A. I only
- B. I & II only
- C. I, II & III
- D. None of the above

4. Given that the range and the standard deviation of a set of data are 50 and 8.3 respectively. Find the range and the standard deviation if 45 is added to each of the data.

- A. Range = 50, standard deviation = 8.3
- B. Range = 95, standard deviation = 53.3
- C. Range = 95, standard deviation = 8.3
- D. None of the above



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