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TUTGATHER PRACTICE PAPER

HONG KONG DIPLOMA OF SECONDARY EDUCATION EXAMINATION 2027

Candidate Number

MATHEMATICS Compulsory Part
PAPER 1

Question-Answer Book

TUTGATHER
PRACTICE PAPER · NOT AN OFFICIAL HKEAA PAPER

1 hour 5 minutes

This paper must be answered in English

Topic practice: Measures of Dispersion

INSTRUCTIONS

(1) This paper consists of THREE sections, A(1), A(2) and B.

(2) Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question-Answer Book. Do not write in the margins.

(3) Unless otherwise specified, all working must be clearly shown.

(4) Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.

(5) The diagrams in this paper are not necessarily drawn to scale.

(6) Calculators and mathematical drawing instruments may be used.

(7) The marks for each question are shown in brackets.

(8) No extra time will be given after the 'Time is up' announcement.

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SECTION A(1) (16 marks)

1. The following data show the numbers of books borrowed by 11 students in a month: **(3 marks)**

3, 5, 5, 6, 8, 9, 10, 12, 12, 15, 20

(a) Find the range.
(b) Find the interquartile range.

2. The mean of five numbers 4, 7, 9, 12, 18 is 10. **(3 marks)**
(a) Find the standard deviation of these five numbers.
(b) If each number is increased by 3, write down the new standard deviation.

3. The box-and-whisker diagram below summarises the marks of a class in a test. **(4 marks)**

Minimum = 12, Q_1 = 28, Median = 45, Q_3 = 60, Maximum = 88.

(a) Find the range and the interquartile range.
(b) Describe the skewness of the distribution. Justify your answer briefly.

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4. A set of 10 data values has mean 20 and standard deviation 4. **(6 marks)**

(a) Each data value is multiplied by 3 and then 5 is subtracted. Find the new mean and the new standard deviation.

(b) Each data value is increased by 10%. Find the new mean and the new standard deviation.

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SECTION A(2) (24 marks)

5. The box-and-whisker diagrams below show the monthly salaries (in \$1000) of employees in two companies, A and B. **(7 marks)**

Company A: min = 12, Q_1 = 18, median = 24, Q_3 = 32, max = 50.
Company B: min = 15, Q_1 = 20, median = 26, Q_3 = 34, max = 45.

(a) Compare the median salaries of the two companies.
(b) Compare the interquartile ranges.
(c) Compare the overall ranges.
(d) Which company has a more spread-out middle 50% of salaries? Explain.
(e) A person says: "Company A pays higher salaries on average because its maximum is higher." Comment on this statement.

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6. The following table shows the distribution of the numbers of hours spent on social media per week by a group of 40 teenagers. **(8 marks)**

Hours	0 − 4	4 − 8	8 − 12	12 − 16	16 − 20
Frequency	6	10	14	7	3

(a) Find the interquartile range.

(b) Find the range.

(c) A teenager is selected at random. Estimate the probability that the teenager spends more than 10 hours per week.

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7. The mean and standard deviation of the scores of 20 students in a test are 60 and 8 respectively. It is later found that one score was wrongly recorded as 80 instead of 50. **(9 marks)**

(a) Find the correct mean.

(b) Find the correct standard deviation.

(c) If the test scores are adjusted by adding 5 marks to each student, find the new mean and standard deviation.

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SECTION B (10 marks)

8. The box-and-whisker diagram below shows the distribution of the ages of 24 members of a club. **(10 marks)**

Minimum = 15, Q_1 = 22, Median = 30, Q_3 = 41, Maximum = 60.

(a) Find the range and the interquartile range.
(b) Describe the skewness of the distribution. Justify your answer.
(c) It is known that exactly 6 members are aged 41 or above. Find the number of members aged between 22 and 41 inclusive.
(d) A new member aged 70 joins the club. Without drawing a new diagram, explain how the median and the interquartile range would change.

END OF PAPER

Answers written in the margins will not be marked.
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