



# Data Representation & Interpretation

# 7

μnit Test

**Free and always will be!**

**Instructions:** Read all questions carefully to ensure you understand what is being asked. When completing your official tests / exams, your grade will be based upon your: **understanding, fluency, reasoning, and problem solving**, so ensure you show all lines of working and draw accurate, labelled diagrams where necessary. (ACiQ|9.0 Mathematics standard elaborations found on final page (general assessment marking standards)). [Practise tests are marked out of a score of 10]. For multiple choice questions, tick or fill in the circle next to the corresponding letter under the question.

Check your work if you have time. *Remember:* you don't have to start at question one, it's always best to firstly look through the test, highlight the easy looking questions and complete them first, then secondly, go back through and work on the harder questions. Good luck! And remember to breathe!

$$\Sigma = \frac{\quad}{10} = \quad \%$$

## Part 1: Multiple Choice (2 marks)

### Question 1:

Which type of graph is best used to show changes over time?

A. Bar Graph

B. Pie Chart

C. Line Graph

D. Pictograph

☐ A

☐ B

☐ C

☐ D

Space for question 1:



**Question 2:**

**What does the mode represent in a set of data?**

- A. The middle value when the data is ordered**
- B. The average of all values**
- C. The most frequently occurring value**
- D. The difference between the highest and lowest value**

☐ **A**

☐ **B**

☐ **C**

☐ **D**

Space for question 2:

**Part 2: Short Answer (4 marks)**

**Question 3:**

**Explain what a 'mean' is and calculate the mean of the following dataset: {4, 7, 1, 9, 3} .**



**Question 4:**

**Draw a bar chart for the following data showing the number of students preferring each subject:**

**Math: 12**

**Science: 8**

**English: 15**

**History: 5**





### Part 3: Problem Solving (4 marks)

#### Question 5:

A survey was conducted on 30 students in Year 7 to see how many hours they study per week. The results were:

0 – 5 hours: 10 students

6 – 10 hours: 12 students

11 – 15 hours: 5 students

16+ hours: 3 students

Create a pie chart to represent this data.



**Question 6:**

You collected data on the heights of 3 different plants in *cm* over five weeks:

|        | Plant 1 | Plant 2 | Plant 3 |
|--------|---------|---------|---------|
| Week 1 | 10      | 12      | 15      |
| Week 2 | 14      | 18      | 20      |
| Week 3 | 18      | 24      | 25      |
| Week 4 | 23      | 27      | 30      |
| Week 5 | 28      | 32      | 35      |

Plot this data on a line graph to show growth over time.



## Solutions

1. (1 mark)

C. Line Graph.

- Line graphs are ideal for displaying trends over time.

2. (1 mark)

C. The most frequently occurring value.

- Mode is the value that appears most often in a data set.

3. (2 marks)

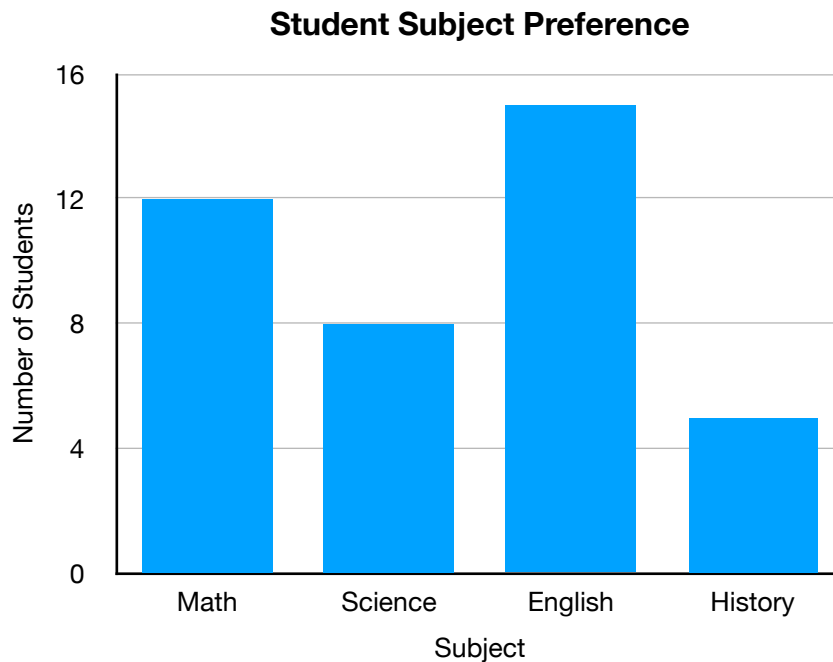
Mean is the sum of all values divided by the number of values.

Calculation:

$$\begin{aligned}\text{Mean} &= \frac{(4 + 7 + 1 + 9 + 3)}{5} \\ &= \frac{24}{5} \\ &= 4.8.\end{aligned}$$

4. (2 marks)

[Description for drawing a bar chart with 4 bars, each representing the number of students per subject.]





5. (2 marks)

[Description for drawing a pie chart where each segment represents the percentage of students in each study hour range.]

● 0-5 ● 6-10 ● 11-15 ● 16+

**Weekly Study Time of Year 7 Students**



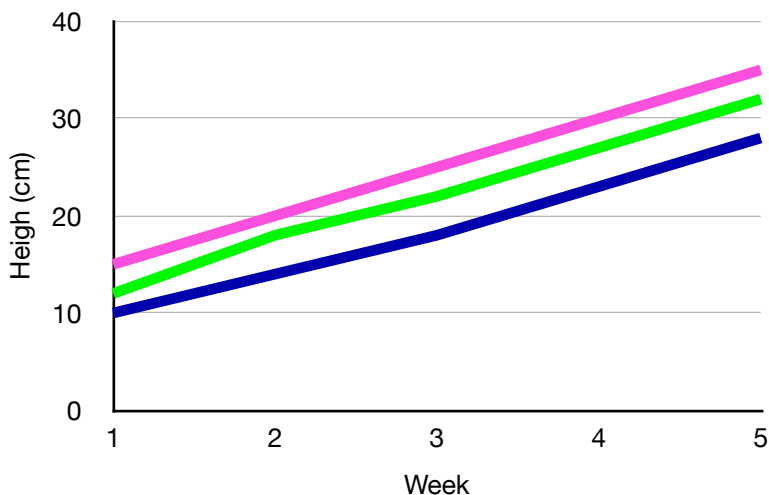
$$\text{Angle of each section} = \frac{\text{Number of Students in each Study Period}}{\text{Total Students}} \times 360^\circ$$

6. (2 marks)

[Description for plotting the average height per week on a line graph, showing a trend of growth over time.]

— Plant 1 — Plant 2 — Plant 3

**Plant Growth Over Five Weeks**



$$\Sigma = \frac{\quad}{10} = \quad \%$$



# Probability

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$$\Sigma = \frac{\quad}{10} = \quad \%$$

### Part 1: Multiple Choice (2 marks)

#### Question 1:

If you have a bag with 3 red balls and 2 blue balls, what is the probability of picking a red ball?

A.  $\frac{1}{5}$

B.  $\frac{3}{5}$

C.  $\frac{2}{5}$

D.  $\frac{1}{2}$

☐ A

☐ B

☐ C

☐ D

Space for question 1:





**Question 2:**

**What does a probability of 0 mean?**

- A. The event is very unlikely but still possible.**
- B. The event will certainly happen.**
- C. The event is impossible.**
- D. The event has an equal chance of happening or not.**

☐ **A**

☐ **B**

☐ **C**

☐ **D**

Space for question 2:

**Part 2: Short Answer (4 marks)**

**Question 3:**

**Describe how to find the probability of an event.**



**Question 4:**

**If you roll a fair six-sided die, what is the probability of rolling an even number?**



### Part 3: Problem Solving (4 marks)

#### Question 5:

A spinner has 4 equal sections coloured red, blue, green, and yellow. What is the probability of landing on blue after one spin?

#### Question 6:

You have a deck of cards with 10 cards, numbered from 1 to 10 . If you draw one card at random, what is the probability that it's a prime number?



## Solutions

1. (1 mark)

B.  $\frac{3}{5}$

- There are 5 balls in total, and 3 are red, so the probability is 3 out of 5 .

2. (1 mark)

C. The event is impossible

- A probability of 0 means the event cannot or will not occur.

3. (2 marks)

Probability of an event is calculated as the number of favourable outcomes divided by the total number of possible outcomes. Mathematically,

$$P(\text{event}) = \frac{\text{Number of favorable outcomes}}{\text{Total number of possible outcomes}} .$$

4. (2 marks)

There are 3 even numbers (2, 4, 6) out of 6 possible outcomes, so the probability is

$$\begin{aligned} &\rightarrow \frac{3 \div 3}{6 \div 3} \\ &= \frac{1}{2} . \end{aligned}$$

5. (2 marks)

Since there are 4 sections and only one is blue, the probability is:

$$\frac{1}{4} .$$

6. (2 marks)

Prime numbers between 1 and 10 are 2, 3, 5, and 7 (4 primes).

Thus, the probability is:

$$\begin{aligned} &\rightarrow \frac{4 \div 2}{10 \div 2} \\ &= \frac{2}{5} . \end{aligned}$$

$$\Sigma = \frac{\quad}{10} = \quad \%$$



## General Assessment Marking Standards

**Remember:** When your official tests are marked, they won't be a score out of 10, they will be a grade (A,B,C,D,E) based on the following standards:

ACiQ|v9.0

### Year 7 Mathematics standard elaborations

|                            |                 | A  | B   | C   | D  | E   |
|----------------------------|-----------------|--|---|---|--|---|
|                            |                 | The folio of student work contains evidence of the following:  |   |   |  |   |
| Mathematical proficiencies | Understanding   | accurate and <b>consistent</b> identification, representation, description and connection of mathematical concepts and relationships in <b>complex unfamiliar</b> , complex familiar, and simple familiar situations | <b>accurate</b> identification, representation, description and connection of mathematical concepts and relationships in <b>complex familiar</b> and simple familiar situations | identification, representation, description and connection of mathematical concepts and relationships in simple familiar situations | <b>partial</b> identification, representation and description of mathematical concepts and relationships in <b>some</b> simple familiar situations | <b>fragmented</b> identification, representation and description of mathematical concepts and relationships in <b>isolated and obvious</b> situations |
|                            | Fluency         | choice, use and application of <b>comprehensive</b> facts, definitions, and procedures to find solutions in <b>complex unfamiliar</b> , complex familiar, and simple familiar situations                             | choice, use and application of <b>effective</b> facts, definitions, and procedures to find solutions in <b>complex familiar</b> and simple familiar situations                  | choice, use and application of facts, definitions, and procedures to find solutions in simple familiar situations                   | choice and use of <b>partial</b> facts, definitions, and procedures to find solutions in <b>some</b> simple familiar situations                    | choice and use of <b>fragmented</b> facts, definitions and procedures to find solutions in <b>isolated and obvious</b> situations                     |
|                            | Reasoning       | <b>comprehensive</b> explanation of mathematical thinking, strategies used, and conclusions reached in <b>complex unfamiliar</b> , complex familiar, and simple familiar situations                                  | <b>detailed</b> explanation of mathematical thinking, strategies used, and conclusions reached in <b>complex familiar</b> and simple familiar situations                        | explanation of mathematical thinking, strategies used, and conclusions reached in simple familiar situations                        | <b>partial</b> explanation of mathematical thinking, strategies used, and conclusions reached in <b>some</b> simple familiar situations            | <b>fragmented</b> explanation of mathematical thinking, strategies used, and conclusions reached in <b>isolated and obvious</b> situations            |
|                            | Problem-solving | <b>purposeful</b> use of problem-solving approaches to find solutions to problems.   | <b>effective</b> use of problem-solving approaches to find solutions to problems.   | use of problem-solving approaches to find solutions to problems.  | <b>partial</b> use of problem-solving approaches <b>to make progress towards</b> finding solutions to problems.                                    | <b>fragmented</b> use of problem-solving approaches to make progress towards finding solutions to problems.   |
| <b>Key</b>                 |                 | shading emphasises the qualities that discriminate between the A–E descriptors   |   |   |  |   |

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