The Panda Math Tutor

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Collection, Classification and Organisation of Data

IGCSE Mathematics - Statistics

The Panda Math Tutor

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1 Introduction to Data and Statistics

Note

Statistics is the branch of mathematics concerned with gathering, arranging, analysing, and drawing conclusions from data. A solid grasp of how to collect and organise data is essential before any meaningful analysis can take place.
In this chapter, we will explore:

- Understanding different types of data
- Methods for collecting data
- Sampling techniques
- Organizing data using tables and charts
- Classifying data into meaningful groups
- Applications to real-world scenarios

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Definition

Data refers to individual facts, figures, or pieces of information gathered for the purpose of analysis and interpretation.
Statistics is the area of mathematics focused on the collection, organisation, analysis, interpretation, and presentation of data.
Example: The reaction times of athletes, weekly rainfall measurements, quiz results, and types of pets owned by your classmates are all examples of data.

2 Types of Data

2.1 Qualitative vs Quantitative Data

Definition

Qualitative Data (Categorical Data) describes attributes or characteristics and cannot be expressed as numbers.
Quantitative Data (Numerical Data) consists of numerical values that can be measured or counted.

Examples:

- **Qualitative:** Nationalities, genres of music, flavours of ice cream, types of transport
- **Quantitative:** Lengths, speeds, populations, scores on a test, volumes

Example

Classify each type of data as qualitative or quantitative:
(a) The number of passengers on a bus
(b) The breed of dogs at a park
(c) The distance from home to school
(d) The type of cuisine at restaurants in a town
(e) The daily rainfall in millimetres

Solution:

(a) **Quantitative** - number of passengers can be counted

(b) **Qualitative** - breed is a descriptive category, not a number

(c) **Quantitative** - distance can be measured

(d) **Qualitative** - type of cuisine is a category, not a number

(e) **Quantitative** - rainfall can be measured

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2.2 Discrete vs Continuous Data

Definition

Discrete Data can only take particular, separate values (often whole numbers). You **count** discrete data.
Continuous Data can take any value within a given range, including decimals and fractions. You **measure** continuous data.

Key Difference: Between any two values of continuous data, there are infinitely many possible values. This is not the case for discrete data.

Examples:

- **Discrete:** Number of rooms in a house, number of pets owned, number of letters in a word
- **Continuous:** Mass, speed, capacity, temperature, length

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