Ratio, proportion and rates of change

change freely between related standard units [for example time, length, area, volume/capacity, mass]

use scale factors, scale diagrams and maps

express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1

use ratio notation, including reduction to simplest form

divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio

understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction

relate the language of ratios and the associated calculations to the arithmetic of fractions and to linear functions

solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics

solve problems involving direct and inverse proportion, including graphical and algebraic representations

use compound units such as speed, unit pricing and density to solve problems

Probability

record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale

understand that the probabilities of all possible outcomes sum to 1

enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams

generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities

Statistics

describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)

construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data

describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs

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