AQA GCSE Maths – Ratio, Proportion & Rates of Change

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Subject: Maths

Grade: KS4

Detailed revision guide for the Ratio, Proportion & Rates of Change topic in AQA GCSE Maths covering definitions, examples, methods, advantages, disadvantages, and practice questions.

Ratio, Proportion & Rates of Change – AQA GCSE Maths (8300)

Key Concepts

- Understanding and simplifying ratios
- Direct and inverse proportion
- Percentages: increase, decrease, and change
- Compound measures (speed, density, pressure)
- Exchange rates and best buys
- Proportional reasoning and scaling

Definitions & Examples

- Ratio: A comparison of two quantities, e.g., 3:4.
- Direct Proportion: Two quantities increase/decrease at the same rate, e.g., $y = 2x$.
- Inverse Proportion: One quantity increases as the other decreases, e.g., $y = 12/x$.
- Percentage Change: ((new - original)/original) × 100%
- Compound Measure: Combination of two measures, e.g., speed = distance ÷ time.

Methods

- Simplify ratios by dividing both parts by their greatest common factor
- Use direct proportion equations ($y = kx$) and inverse proportion equations ($y = k/x$)
- Calculate percentage increase/decrease using the formula
- Apply scaling to recipes, maps, models
- Convert units in compound measures
- Use proportional reasoning to solve word problems

Advantages & Disadvantages

- Advantages: Useful for real-life applications, supports reasoning skills, widely applied in science, finance, and everyday problem-solving.
- Disadvantages: Can be confusing when multiple steps are required, errors easily occur if units are inconsistent, negative or fractional scaling may be tricky.

Practice Questions

- Simplify the ratio 18:24
- y is directly proportional to x. When x = 5, y = 15. Find y when x = 12.
- y is inversely proportional to x. When x = 4, y = 6. Find y when x = 12.
- A price of £80 is reduced by 25%. Calculate the new price.
- A car travels 150 km in 3 hours. Calculate its average speed.
- A model is 1:50 scale. A wall is 2m high in real life. What is the height of the model wall?