UNIT : 4c Ratio and Proportion | **GCSE HIGHER** | **DAWLISH COLLEGE MATHEMATICS DEPARTMENT**

<table>
<tr><th>Key Word/Fact</th><th>Definition / Rule</th><th>Example</th></tr>
<tr><td>Ratio</td><td>A relationship between two numbers indicating how many times the first number contains the second.</td><td>If a bowl of fruit contains eight oranges and six lemons, then the ratio of oranges to lemons is ‘eight to six’, written 8 : 6.</td></tr>
<tr><td>Parts</td><td>The individual numbers that make up a ratio.</td><td>The ratio 5 : 9 is made up of 5 parts and 9 parts.

The ratio 5 : 9 has 14 parts in total.</td></tr>
<tr><td>Simplifying a Ratio</td><td>To reduce a ratio to its lowest terms by dividing by a common factor.</td><td>12 : 20 = 4 : 5 (divide both sides by 4)

13 : 39 = 1 : 3 (divide both sides by 3)</td></tr>
<tr><td>Sharing in a Ratio</td><td>A method of sharing out an amount in a given ratio.</td><td>Share £30 in the ratio 2:3.
£30
£6 | £6 | £6 | £6 | £6
£12 | £18</td></tr>
<tr><td>Unit Ratio</td><td>A ratio where the first number is a one. The general form of a unit ratio is 1 : n.</td><td>The ratio 5 : 20 can be written as the unit ratio 1 : 4.

The ratio 2 : 5 can be written as the unit ratio 1 : 2.5.</td></tr>
<tr><td>Best Value/Unitary method</td><td>A method of deciding which offer is the best value for money.

A common method is to find the price for one unit then comparing the cost per unit.</td><td>A pack of 20 toilet rolls costs £6.80.
A pack of 9 toilet rolls costs £2.61.
Which pack gives the better value for money?
Show how you decide.
The first option costs £6.80 ÷ 20 = £0.34 per roll.
The second option costs £2.61 ÷ 9 = £0.29 per roll.
The pack of 9 is the best value for money.</td></tr>
<tr><td>Proportion</td><td>A relationship between two quantities.</td><td><table>
<tr><th>Serves 4</th><th>Serves 8</th><th>Serves 12</th><th>Serves 2</th></tr>
<tr><td>40 ml yoghurt</td><td>80 ml</td><td>120 ml</td><td>20 ml</td></tr>
<tr><td>72 g flour</td><td>144 g</td><td>216 g</td><td>36 g</td></tr>
<tr><td>104 g sugar</td><td>208 g</td><td>312 g</td><td>52 g</td></tr>
<tr><td>8 g potatoes</td><td>16 g</td><td>24 g</td><td>4 g</td></tr>
</table></td></tr>
<tr><td>Direct Proportion</td><td>A relationship between two variables where as one increases, the other also increases.

If y is directly proportional to x, this can be written as $y \propto x$.</td><td>If two quantities are in direct proportion, as one increases, the other increases by the same percentage.

A common example is a recipe where the quantity of ingredients required is proportional to how many people the recipe can serve.</td></tr>
<tr><td>Inverse Proportion</td><td>A relationship between two variables where as one increases, the other decreases.

If y is directly proportional to x, this can be written as $y \propto 1 / x$</td><td>An example of inversely proportional quantities is the lengths and widths of rectangles with the same area.

If the length increases, the width has to decrease for the areas to stay the same.</td></tr>
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