|  |  |  | Year 8 Mathematics Core HT 5 |
| :---: | :---: | :---: | :---: |
| Proportion graphs |  |  |  |
| 1. | Proportion | Compares a part with a whole |  |
| 2. | Direct proportion | Two quantities increase at the same rate <br> Graph is a straight line that goes through the origin | $y \propto x$ <br> $y=k x$ for a constant $k$ |
| 3. | Inverse/indirect proportion | One variable increases at a constant rate as the second variable decreases | $y \propto \frac{1}{x}$ <br> $y=\frac{k}{x}$ for a constant $k$ |
| Linear graphs |  |  |  |
| 4. | Gradient | The steepness of a graph $\begin{aligned} \text { Gradient }= & \frac{\text { change in } y}{\text { change in } x} \\ & =\frac{\text { rise }}{\text { run. }} \end{aligned}$ |  |
| 5. | Gradient between two points | $\text { If } \mathrm{A}=\left(\mathrm{x}_{1}, \mathrm{y}_{1}\right) \text { and } \mathrm{B}=\left(\mathrm{x}_{2}, \mathrm{y}_{2}\right)$ <br> The gradient of line $A B=$ $\frac{y_{2}-y_{1}}{x_{2}-x_{1}}$ |  |
| 6. | Parallel lines | Have the same gradients |  |
| 7. | Mid-point | The coordinate half way between two point | If $\mathrm{A}=\left(x_{1}, y_{1}\right)$ and $\mathrm{B}=\left(x_{2}, y_{2}\right)$ the mid-point is $\left(\frac{x_{1}+x_{2}}{2}, \frac{y_{1}+y_{2}}{2}\right)$ |


| 8. | Linear function | An arithmetic sequence that can be represented by a straight line graph |  |
| :---: | :--- | :--- | :--- |
| 9. | Linear equation | An equation that produces $\alpha$ straight line graph |  |
| 10. | $y=m x=c$ | The general equation of $\alpha$ straight <br> line | $m=$ gradient and $c=y$ intercept |


| Percentages |  |  |  |
| :---: | :---: | :---: | :---: |
| 11. | Percentage | Means 'out of 100' |  |
| 12. | Multiplier | A decimal you multiply by to represent a percentage |  |
|  |  | To use a multiplier to find a percentage, divide your percentage by 100, then multiply the amount by this value. |  |
| 13. | Percentage increase | Calculate the percentage and add onto the original |  |
|  |  | Or use a multiplier | $\text { amount } \times \frac{100+\% \text { increase }}{100}$ |
| 14. | Percentage decrease | Calculate the percentage and subtract from the original |  |
|  |  | Or use a multiplier | $\text { amount } \times \frac{100-\% \text { increase }}{100}$ |
| 15. | Percentage change | $\frac{\text { Change }}{\text { Original }} \times 100$ |  |
| 16. | Express one number as a percentage of another | $\frac{\text { Number } 1}{\text { Number } 2} \times 100$ |  |
|  | Reverse percentage | Use when asked to find the priginal amount after a percentage increase or decrease. |  |
| 17. |  | $\begin{aligned} & \text { Original Value } \times \text { Multiplier }=\text { New Value } \\ & \text { Original Value }=\frac{\text { New Value }}{\text { Multiplier }} \end{aligned}$ |  |
| 18. | Interest | A fee paid for borrowing money or money earnt through investing. |  |
| 19. | Simple interest | Interest that is calculated as a percentage of the original | $\begin{aligned} & \quad I=\text { Prt } \\ & \text { I - Interest } \\ & \text { P - Original amount } \\ & r \text { - interest rate } \\ & t \text { - time } \end{aligned}$ |
| 20. | Compound interest | When interest is calculate on the original amount and any previous interest | $\begin{aligned} & \qquad P\left(\mathbf{1}+\frac{\boldsymbol{R}}{\mathbf{1 0 0}}\right)^{n} \\ & \text { P- Original amount } \\ & \mathrm{R} \text { - Interest rate } \\ & \mathrm{n} \text {-the number of interest periods (e.g. yrs) } \end{aligned}$ |
|  |  | OR $\text { Original } \times \text { Multiplier }{ }^{\text {time }}$ |  |
| 21. | Tax | A financial charge placed on sales or | avings by the government e.g. VAT |


| 22. | Loss |  |  | Income minus all expenses, resulting in a negative value |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 23. | Profit |  |  | Income minus all expenses, resulting in a positive value |  |  |  |  |  |  |
| 24. | Depreciation |  |  | A reduction in the value of a product over time |  |  |  |  |  |  |
| 25. | Annual |  |  | Means yearly |  |  |  |  |  |  |
| 26. | Per annum |  |  | Means per year |  |  |  |  |  |  |
| 27. | Salary |  |  | A fixed regular payment, often paid monthly |  |  |  |  |  |  |
| FDP Conversions |  |  |  |  |  |  |  |  |  |  |
| 29. | Percentage to decimal |  |  | Divide by 100 |  |  |  |  |  |  |
| 30. | Decimal to percentage |  |  | Multiply by 100 |  |  |  |  |  |  |
| 31. | Fraction to percentage |  |  | Find an equivalent fraction with 100 as the denominator |  |  |  |  |  |  |
| 32. | Percentage to fraction |  |  | Write as a fraction over 100 then simplify |  |  |  |  |  |  |
| 33. | Fraction to decimal |  |  | Carry out division or convert to a percentage first |  |  |  |  |  |  |
| 34. | Decimal to fraction |  |  | Use place value to find the denominator and simplify or convert to a percentage first. |  |  |  |  |  |  |
| Basics to memorise |  |  |  |  |  |  |  |  |  |  |
|  | Fraction | $\frac{1}{100}$ | $\frac{1}{10}$ | $\frac{1}{8}$ | $\frac{1}{5}$ | $\frac{1}{4}$ | $\frac{1}{3}$ | $\frac{1}{2}$ | $\frac{2}{3}$ | $\frac{3}{4}$ |
| 35. | Decimal | 0.01 | 0.1 | 0.125 | 0.2 | 0.25 | 0.3 | 0.5 | 0.6 | 0.75 |
|  | Percentage | 1\% | 10\% | 12.5\% | 20\% | 25\% | 33.3\% | 50\% | 66.7\% | 75\% |


|  |  |  |  | Year 8 Mathematics Core HT 6 |
| :---: | :---: | :---: | :---: | :---: |
| Analysing and displaying data |  |  |  |  |
| 1. | Types of Data | Qualitative Data - non-numerical data <br> Quantitative Data - numerical data <br> Continuous Data - data that can take any numerical value within a given range. <br> Discrete Data - data that can take only specific values within a given range. <br> Example: <br> Qualitative Data - eye colour, gender etc. <br> Continuous Data - weight, voltage etc. <br> Discrete Data - number of children, shoe size etc. |  |  |
| 2. | Grouped Data | Data that has bee Seen in grouped fr | undled in to categories. <br> ency tables, histograms, cum | lative frequency etc. |
| 3. | Pie Chart | Used for showing how data brealks down inte its constituent parts. <br> When drawing a pie chart, divide $360^{\circ}$ by the total frequency. This will tell you how many degrees to use for the frequency of each category. <br> Remember to label the category that each sector in the pie chart represents. <br> If there are 40 people in a survey, then each person will be worth $360 \div 40=9^{\circ}$ of the pie chart. |  |  |
| 4. | Cumulative Frequency | Cumulative Frequ | is a running total. |  |



| 8. | Scatter Graph | A graph in which values of two variables are plotted along two axes to compare them and see if there is any connection between them. |
| :---: | :---: | :---: |
| 9. | Correlation | Correlation between two sets of data means they are connected in some way. <br> There is correlation between temperature and the number of ice creams sold. |
| 10. | Positive Correlation | As one value increases the other value increases. <br> Positive Correlation |
| 11. | Negative Correlation | As one value increases the other value decreases. |
| 12. | No Correlation | There is no linear relationship between the two. $\qquad$ <br> No Correlation |
| 13. | Strong Correlation | When two sets of data are closely linked. |


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| :---: | :---: | :---: |
| 14. | Weak Correlation | When two sets of data have correlation, but are not closely linked. <br> Positive <br> Correlation |
| 15. | Causality | When one variable influences another variable. <br> The more hours you work at a particular job (paid hourly), the higher your income from that job will be. |
| 16. | Line of Best Fit | A straight line that best represents the data on a scatter graph. |
| 17. | Outlier | A value that 'lies outside' most of the other values in a set of data. <br> An outlier is much smaller or much Iarger than the other values in a set of data |

