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| **H Unit 6: Graphs** | **Road Map** | | | | | |
| In this unit you will learn about number. The aims are as follows:  **LG1**: Knowledge  **LG2**: Application  **LG3**: Skills | Assessment Grades |  |  | | | |
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| **Themes** | **Learning Goals/Outcomes/Content** | | |  |  |  |
| 6a Graphs: the basics and real-life graphs | Identify and plot points in all four quadrants; | | |  |  |  |
| Draw and interpret straight-line graphs for real-life situations, including ready reckoner graphs, conversion graphs, fuel bills, fixed charge and cost per item; | | |  |  |  |
| Draw distance–time and velocity–time graphs; | | |  |  |  |
| Use graphs to calculate various measures (of individual sections), including: unit price (gradient), average speed, distance, time, acceleration; including using enclosed areas by counting squares or using areas of trapezia, rectangles and triangles; | | |  |  |  |
| Find the coordinates of the midpoint of a line segment with a diagram given and coordinates; | | |  |  |  |
| Find the coordinates of the midpoint of a line segment from coordinates; | | |  |  |  |
| Calculate the length of a line segment given the coordinates of the end points; | | |  |  |  |
| Find the coordinates of points identified by geometrical information. | | |  |  |  |
| Find the equation of the line through two given points. | | |  |  |  |
| 6b Linear graphs and coordinate geometry | Plot and draw graphs of *y* = *a*, *x* = *a*, *y* = *x* and *y* = –*x*, drawing and recognising lines parallel to axes, plus *y* = *x* and *y* = –*x*; | | |  |  |  |
| Identify and interpret the gradient of a line segment; | | |  |  |  |
| Recognise that equations of the form *y* = *mx* + *c* correspond to straight-line graphs in the coordinate plane; | | |  |  |  |
| Identify and interpret the gradient and *y*-intercept of a linear graph given by equations of the form *y* = *mx* + *c*; | | |  |  |  |
| Find the equation of a straight line from a graph in the form *y* = *mx* + *c*; | | |  |  |  |
| Plot and draw graphs of straight lines of the form *y* = *mx* + *c* with and without a table of values; | | |  |  |  |
| Sketch a graph of a linear function, using the gradient and *y*-intercept (i.e. without a table of values); | | |  |  |  |
| Find the equation of the line through one point with a given gradient; | | |  |  |  |
| Identify and interpret gradient from an equation *ax* + *by* = *c*; | | |  |  |  |
| Find the equation of a straight line from a graph in the form *ax* + *by* = *c*; | | |  |  |  |
| Plot and draw graphs of straight lines in the form *ax* + *by* = *c*; | | |  |  |  |
| Interpret and analyse information presented in a range of linear graphs: | | |  |  |  |
| use gradients to interpret how one variable changes in relation to another; | | |  |  |  |
| find approximate solutions to a linear equation from a graph; | | |  |  |  |
| identify direct proportion from a graph; | | |  |  |  |
| Explore the gradients of parallel lines and lines perpendicular to each other; | | |  |  |  |
| Interpret and analyse a straight-line graph and generate equations of lines parallel and perpendicular to the given line; | | |  |  |  |
| Select and use the fact that when *y* = *mx* + *c* is the equation of a straight line, then the gradient of a line parallel to it will have a gradient of *m* and a line perpendicular to this line will have a gradient of . | | |  |  |  |
| 6c Quadratic, cubic and other graphs | Recognise a linear, quadratic, cubic, reciprocal and circle graph from its shape; | | |  |  |  |
| Generate points and plot graphs of simple quadratic functions, then more general quadratic functions; | | |  |  |  |
| Find approximate solutions of a quadratic equation from the graph of the corresponding quadratic function; | | |  |  |  |
| Interpret graphs of quadratic functions from real-life problems; | | |  |  |  |
| Draw graphs of simple cubic functions using tables of values; | | |  |  |  |
| Interpret graphs of simple cubic functions, including finding solutions to cubic equations; | | |  |  |  |
| Draw graphs of the reciprocal function  with *x* ≠ 0 using tables of values; | | |  |  |  |
| Draw circles, centre the origin, equation *x*2 + *y*2 = *r*2. | | |  |  |  |

**Links:**

LG1: You will know how to recognise, plot and read information from a number of types of graphs, many of which will be more complex than graphs you have encountered before.

LG2: You will apply the number processes from this topic to solve equations using graphical methods and interpret graphs of real-life situations.

LG3: Your problem solving skills and mastery of graphs will mean that you can solve some complex problems involving parallel and perpendicular lines.