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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.