

Scheme of Learning: Year 11 Higher Autumn Term

Topic Sequence:

1	2	3	4
Gradients and Lines	Non-Linear Graphs	Using Graphs	Graph Transformations

Topic Overview: Gradients and Lines

In this topic we build on earlier study of straight line graphs. Students plot lines from a given equation, and find and interpret the equation of a straight line from a variety of situations and given information. Students also revisit graphical solutions of simultaneous equations and study the equations of perpendicular lines.

Learning Sequence:

Equation of a line parallel to the axis

Students should be able to recognise and use the equations of lines parallel to the axis and understand that any point on a line satisfies the equation of that line. Also that all lines in the form $y = a$ are parallel to the x-axis, and all lines in the form $x = b$ are parallel to the y-axis.

Plotting straight line graphs

Students should be able to generate coordinates for a table of values using $y = mx + c$ and plot and join the points to form a straight line

Interpreting $y = mx + c$

Students recap that the equation of a line is given in the form $y = mx + c$ where m represents the gradient and the graph intercepts the y-axis at $(0, c)$

Find the equation of a straight line from a graph

Students recap how to find the gradient and also the y-intercept from a graph

Equation of a straight line graph from a point and a given gradient

Students find the equation of a line given the gradient and a point that lies on the line using their knowledge of parallel lines having the same gradient

Equation of a line from two points

Students work out the full equation of a line from two coordinates, finding the gradient first and then using substitution of one of the coordinates to find the y-intercept

Determine whether a point is on a line

Students understand that the equation of a line is a relationship between the x and y coordinates at any point on that line. Any point on a grid that does not satisfy this equation, therefore does not lie on the line.

Solve simultaneous equations graphically

Students should understand that two straight lines will only ever cross at one point, and the coordinates of this point provide the solutions to the pair of simultaneous equations.

Explore and find equations of perpendicular lines

Students should be aware that perpendicular lines intercept at right angles and the product of a pair of perpendicular lines will always be -1. Using this knowledge, they will find the gradient of a line perpendicular to another and then find the y intercept to give the full equation of $y = mx + c$

Sequence of Learning:		Topic Resources:	
1	Equation of lines parallel to the axis (recap)	Knowledge Maps:	Linear Graphs Algebraic Notation and Manipulation
2	Plotting straight line graphs (recap)		
R	Interpreting $y = mx + c$ (recap)	Assessment:	
4	Find the equation of a straight line from a graph	Knowledge:	End of Topic test
5	Equation of a straight line from a point and a given gradient	Application of Knowledge:	Termly summative assessment
6	Equation of a straight line from two points	Supportive Reading:	
7	Determine whether a point is on a line		Sparx Maths www.sparxmaths.co.uk
8	Solve linear simultaneous equations graphically		Corbett Maths : www.corbettmaths.com
9	Explore and find equations of perpendicular lines		AQA Revision Guide