

Week 1

This week we will recap the graph work we did in Year 8 starting with lines parallel to the axes. We will use a table of values to work out co-ordinates to plot lines of the form $y = mx + c$. You can use a function machine to help you work out the values.

E.g. $y = 3x + 2$ $x \rightarrow x3 \rightarrow +2 \rightarrow y$

x	-2	-1	0	1	2
y	-4	-1	2	5	8

We will investigate how changing the value of m affects the gradient of the line. The bigger the value of m, the steeper the graph. We will also look at how changing the c value affects the y-intercept of the line. The intercept is where it crosses the y-axis.

Week 2

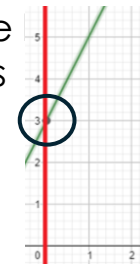
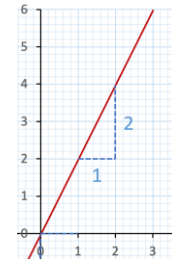
This week we will find the equation of a line drawn on a graph. It will take the form $y = mx + c$.

To work out the gradient of the line, the m value, we draw a triangle under the graph and do the height divided by the width. Here it is 2, so the equation would be $y = 2x$.

To find the y-intercept, the c value, we where the line crosses the y-axis. In this example it is 3, so the equation would be $y = x + 3$.

We will look at real-life graphs that show direct proportion.

Higher learners will look at inverse proportion graphs and perpendicular lines.



Week 3

Our next topic is solving equations.

This week we will recap how to solve 1 and 2 step equations and inequalities. We will solve them by using the inverse operations.

We will further our learning by adding brackets to the equations making them 3 step equations where the first step is to expand the brackets.

Inequalities are solved in the same way but just have a different symbol such as $<$, $>$, \leq or \geq .

E.g. $2(x + 4) = 10$

$$2x + 8 = 10$$

$$- 8 \quad - 8$$

$$2x = 2$$

$$\div 2 \quad \div 2$$

$$x = 1$$

We will stretch ourselves even further by solving equations with an unknown on both sides.

Year 9 Maths: Topics 6, 7 & 8 Graphs, Equations & Conjectures

Week 4

This week our focus turns to formulas.

Formulas are equations with more than one letter in them e.g. $V = l \times w \times h$. In formulas the letters all stand for something, here V stands for volume, l for length, w for width and h for height. The letter in front of the equals is called the subject.

We will learn how to rearrange formulas so the subject changes. We will use the inverse operations again to rearrange the formula. E.g. if we want to find the height we need to divide the volume by the length x width

$$V = l \times w \times h$$

$$\div l \times w \quad \div l \times w$$

$$\frac{V}{l \times w} = h$$

Week 5

The next topic is about testing conjectures. A **conjecture** is an idea or theory that can be either proved or disproved. This topic will develop your reasoning skills.

You will need to come up with examples that prove the conjecture and counter examples that disprove the conjectures.

For example, all prime numbers are odd. An example to prove it would be 5 but a counter example would be 2 as it is even and prime.

We will also decide if something is always, sometimes or never true.

We will stretch ourselves by testing conjectures with algebra as well.

Key Vocabulary

Parallel: Lines that never meet.

Gradient: How steep the line is.

Origin: (0,0) on a graph

Direct Proportion: As one thing increases another thing increases at the same rate.

Inverse Proportion: As one thing increases another thing decreases at the equal opposite rate.

Perpendicular: At a 90° angle to each other

Inverse: Opposite operation

Inequality: The symbols which tell you what a value can be when it is not just equal to one number.

Volume: The amount of solid space inside a 3D shape.

Week 1

Questions	Answers
What do you need to use to help you work out the co-ordinates?	A table of values and a function machine
What form do straight lines take?	$y = mx + c$
What does the m represent?	The gradient of the line
What does the c represent?	The y-intercept of the line
If m increases, what happens to the gradient?	It gets steeper

Week 2

Questions	Answers
How do you work out the gradient of a line?	Draw a triangle under the graph and calculate the height \div width
How do you work of the c value?	Look where the line crosses the y-axis
What kind of real-life graphs are of the form $y = mx + c$?	Direct proportion graphs
What are perpendicular lines?	Lines at 90° to each other
What is inverse proportion?	As one thing increases another thing decreases at the equal opposite rate.

Week 3

Questions	Answers
What does solve the equation mean?	Find the value of the letter.
How do you solve equations?	Use the inverse.
What are the inequality symbols?	$<$, $>$, \leq and \geq
What is the first step in solving this equation? $2(x + 4) = 10$	Expanding the brackets
What is the inverse of multiplication?	Division

Year 9 Maths: Topics 6, 7 & 8 Graphs, Equations & Conjectures

Week 4

Questions	Answers
What is a formula?	An equation with more than one letter
What does the subject of a formula mean?	The number in front of the equals
How do you rearrange a formula?	By using the inverse operations
What is the Volume of a shape?	The amount of solid space inside a 3D shape.

Week 5

Questions	Answers
What is a conjecture?	An idea or theory that can be proved or disproved.
What is a counter example?	An example that disproves the conjecture
What skills are we developing in this topic?	Our reasoning skills
What is a prime number?	A number that only has 2 factors

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