### Mathematics

229 videos

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This programme shows students how to construct 60° and 90° angles using a compass and ruler and then how derive 30° and 45° angles by bisecting each of them respectively.

In this video, the teacher demonstrates how to identify the maximum and minimum possible values of a number that has been rounded, and how to identify upper and lower bounds for continuous data.

In this video, the teacher demonstrates how to identify the maximum and minimum possible values of a number that has been rounded, and how to identify upper and lower bounds for discrete data.

This video shows students what adding a constant does to a graph. It shows the result of adding a positive or negative constant inside or outside the brackets of a parabola or cubic graph.

The programme covers the concept of a pronumeral, numerical substitution, algebraic conventions, developing algebraic rules from number patterns and simplifying expressions. What better place to begin...

This program explains the basic concepts of algebra including number patterns, pronumerals, algebraic expressions, order of operations and expanding and simplifying. The natural and city landscapes of...

Concepts addressed in Solving for X: Algebra I, Volume 1: Variables - She called herself Y. Teary-eyed, one evening she appeared unannounced at his office, asking Detective Nye to uncover the true ide...

Another winner in the Mathemania brand, this is a clear and concise explanation of algebraic notation. In this programme, we start with an introduction to algebraic notation then examine algebraic def...

This clip defines the mathematical concepts of constants and variables before going on to apply index laws to variables using positive integer indices and the zero index. Simplifying equations by add...

This video explains how allied or co-interior angles on parallel lines add up to 180 degrees. To identify them, students must identify a C shape on parallel lines and in finding that, they are able to...
Alternate Angle Theorem
Series: Circle Theorems
This programme showcases the trickiest circle theorem, the alternate angle theorem. The teacher uses the analogy of a sail boat to simplify the process.

Alternate Angles
Series: Angles in Parallel Lines
This video demonstrates how to identify alternate angles by identifying a Z on parallel lines. In doing this, students are able to calculate the degrees of alternate angles.

An Introduction to Integration
Series: Integration
This video gives an introduction about the process of integration, which is the inverse process of differentiation. It shows how to obtain the equation of a curve though the equation of its gradient.

Analysing Inequalities
Series: Algebra for Students
We hear inequality phrases like "more than," "less than" and "in between" all the time. Join our hosts in the world of algebra as they explore what these expressions mean and what it means to analyse...

Angle at the Centre Is Twice the Angle at the Circumference
Series: Circle Theorems
This video demonstrates to students that the angle at the centre of a circle is twice the size of an angle at the circumference.

Angle between a Radius and Tangent Is 90 Degrees
Series: Circle Theorems
In this video, the teacher demonstrates another circle theorem in which the angle between the radius and tangent equals 90 degrees through the use of triangles and algebra.

Angle Bisector
Series: Constructing Angles
This programme shows one of the keys skills needed in geometrical construction. It teaches students how to bisect acute and reflex angles using a compass and ruler.

Angles in a Polygon
Series: Angles in Polygons
The angles of a triangle add up to equal 180 degrees. In this video, students are taught how to find the angles in a polygon by splitting the polygon into triangles. This creates the formula for findi...

Angles in a Semicircle Equal 90 Degrees
Series: Circle Theorems
This programme introduces students to another circle theorem; that angles in a semicircle equal 90 degrees. These angles are made by placing a triangle in the semi-circle.

Angles in a Triangle
Series: Angles in Polygons
This video introduces the three types of triangles; scalene, isosceles and equilateral. Students learn the properties unique to each of these triangles and how to identify them.

Angles in the Same Segment Are Equal
Series: Circle Theorems
Continuing on from "Angle at the Centre Is Twice the Angle at the Circumference", this programme shows students how angles in the same segment are equal by identifying "butterflies" within circles.

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Applying the Differentiation of Trigonometric Functions
Series: Differentiation
This video shows how to use the rules of differentiating trigonometric functions to solve different problems.

Arc Length
Series: Circumference and Area of a Circle
This programme shows students how to calculate the arc length of a circle by using the circumference, radius, and .

Arc Length and Sectors
Series: Circumference and Area of a Circle
In this programme, students are taught to remember and use the formula for the length of an arc. Students also learn the formula for the area of a sector in a circle.

Area of Sectors
Series: Circumference and Area of a Circle
In this video, students learn how to calculate the area of a sector of a circle using the angle provided, radius, and .

Area of Sectors (Advanced)
Series: Circumference and Area of a Circle
This video continues on from “Area of Sectors” providing a more advanced question where students are to find the area of a sector in a circle that is missing a segment.

Area of Segments
Series: Circumference and Area of a Circle
A segment of a circle is found by drawing in a chord and then slicing off the smaller part of the circle. This programme shows students how to find the area of a segment of a circle.

Basic Geometrical Ideas
This programme covers some of the core concepts of geometry. Students will learn about the features of parallel and intersecting lines, circles, triangles, and quadrilaterals.

Basic Index Laws: Games, Set, Match
Series: Numbers and Algebra
This video demonstrates how to use index notation to establish index laws with positive integral indices and the zero index. Using the example of Grand Slam tennis tournaments, our narrator constructs...

Basketballs, Parabolas and Circles
Series: Numbers and Algebra
There’s a lot of geometry on a basketball court! This video explores the connection between algebraic and graphical representations of relations such as simple quadratics, circles and exponentials thr...

Bearings: Scale Diagrams
Series: Geometry
Following on from ‘Bearings: The Rules’, this video applies the knowledge students have learnt about bearings to scale diagrams using practical questions.

Bearings: The Rules
Series: Geometry
This programme introduces students to bearings and the rules involved in their use. The topic is explained using an obtuse angle, angles on parallel lines, and a triangle.

Best Buys: Buying or Making Sandwiches
Series: Numbers and Algebra
A group of friends are planning a lunch and compare the costs of pre-made lunches versus making it themselves. They investigate their options by comparing total costs and per person costs. Calculation...
BIDMAS
Series: Numbers
2013 E 00:03:42
Students learn to understand the concept of the order of precedence in
mathematical operations through the acronym BIDMAS; brackets, index, divide,
multiply, add and subtract.

Bivariate Data and Pool Use
2015 E 00:06:57
This clip investigates how the number of people at the local pool changes over the
course of a day. The data is displayed in graphs showing pool patron numbers
during each 2 hour time period. Follow a...

Boxplots
Series: Representing Data
2013 E 00:06:57
Boxplots or box and whisker diagrams are another way of representing data. This
video demonstrates how to read and draw a boxplot by using the maximum and
minimum values, the median and then the upper...

Calculating Bearings
Series: Geometry
2013 E 00:06:36
In this programme, students learn how to use bearings to describe a direction and
how to solve problems involving bearings.

Calculating Duration across Time Zones
2014 E 00:05:24
Calculating flight distances within and across time zones is a common need. This
clip investigates the arrival and departure times of someone travelling within and
across times zones in Australia and...

Calculating Profit: Earning Your Bread and Butter
Series: Numbers and Algebra
2014 E 00:04:28
Our presenter is interested in running her own café and decides to see what profit
can be made from selling sandwiches. She works through the individual costs of
sandwich ingredients to compare agains...

Comparing Fractions
Series: Numbers
2013 E 00:02:59
The presenter compares fractions in order to explore the concept of fractions, in
particular how to identify and numerically order fractions by converting to the same
denominator.

Completing the Square
Series: Solving Quadratic Equations
2013 E 00:04:56
The teacher demonstrates to students how to use the method known as “completing
the square” to solve quadratic equations.

Compound Area
Series: Geometry
2013 E 00:04:22
Through this programme, students learn how to find the area and perimeter of more
complex shapes made from rectangles and triangles. The two examples presented
ask students to find the area of a compo...

Compound Measure: Distance, Speed, and Time
Series: Numbers
2013 E 00:07:35
A compound measure is a measurement that includes more than one measurement.
This video looks at distance, speed, and time and how speed equals distance over
time.

Congruence and Similarity in Plane Shapes
2014 E 00:04:39
Our ‘tradie’ narrator is busy constructing a playground. Follow along as she goes
beyond practical demonstrations to mathematically prove that she is creating
sunshade shapes that are congruent or sim...
Congruent Shapes and Transformations

Our narrator is planning the layout of a new playground; she needs to recognise properties that determine congruence and which transformations create congruent figures. Follow along as she determines...

Conversions of Length, Area and Volume Units
Series: Geometry

In this video, students learn how to convert between the metric units for area and volume using a rectangle as an example.

Converting Hours and Minutes into Decimals and Vice Versa
Series: Numbers

This video shows students how to convert time into decimals with the use of fractions. This method does not use calculators.

Converting Hours and Minutes into Decimals Using a Calculator
Series: Numbers

With instructions on how to use a calculator, the teacher instructs students on how to convert hours and minutes into decimals using fractions.

Coordinate Geometry
Series: Mathemania Series 3

This programme starts as a student uses a street directory to find a suburban park where she meets a friend to do maths homework. Using a grid reference, the park is located and ideas are expanded to...

Corresponding Angles
Series: Angles in Parallel Lines

This programme informs students of one of the three parallel line angles, corresponding angles. Students learn how to identify it and in doing so, how to calculate an angle using other angles.

Cyclic Quadrilateral
Series: Circle Theorems

This programme introduces students to the concept of cyclic quadrilaterals, which are quadrilateral whose vertices all lie on a single circle. In this video, the focus is specifically on how the oppos...

Decimals: The Accuracy of Numbers
Series: Mathemania Series 4

Decimal numbers come into our lives just about every day. This programme explores the world of decimal numbers where we share a day in the life of the presenter who entertains us in her own quirky way...

Definite Integrals
Series: Integration

This video explains definite integrals, which use limits on the integral signs to come up with a final numerical answer after integrating.

Definitions for Circle Theorems
Series: Circle Theorems

In this video, the teacher introduces and explains to students the basic definitions in circle theorems. These includes circumference, diameter, radius, tangent, and chord.

Destination Distances on a Cartesian Plane
Series: Numbers and Algebra

When the Smithton River floods five local towns, a plane needs to drop supplies at each. A route needs to be determined that will reach the most affected areas first, while ensuring the plane has enou...
Differential Equations
Series: Integration
This video demonstrates how to use integration to remove dy/dx from equations to obtain an equation that is free from any derivatives.

Differentiating Exponentials and Logarithms
Series: Differentiation
This video shows the special rules used to find the derivatives of exponential and logarithmic functions.

Differentiating Implicit Functions
Series: Differentiation
This video shows how to differentiate implicit functions, where the function is not written in the form of y = f(x).

Differentiating Parametric Equations
Series: Differentiation
This video explains how to obtain the derivative of a parametric equation dy/dx, when both the x and y variables depend on a third independent variable, t.

Differentiating Trigonometric Functions
Series: Differentiation
This video shows how to evaluate the derivatives of trigonometric functions, including sin (x), cos (x) and tan (x).

Differentiating with Negative and Fractional Indices
Series: Differentiation
This video shows how to evaluate the derivatives of functions raised to negative or fractional powers, using the power rule.

Distance between Two Points
Series: Coordinates
This video shows students how to find the distance between two points or coordinates by creating a triangle and applying Pythagoras' theorem.

Divisibility Tests: 2–6
Series: Numbers
In this clip, students learn how to apply simple tests of divisibility for the numbers 2–6.

Divisibility Tests: 7–10
Series: Numbers
In this clip, students learn how to apply simple tests of divisibility for the numbers 7–10.

Drawing Prisms
This clip explores prisms and uses computer graphics to show the aerial, front and side views of many different prisms. Throughout the clip, students are prompted to make their own drawings of differe...

Drawing: Cover-Up Method
Series: Graphs
In this video, one method for drawing straight line graphs is shown. By forcing x or y to be 0, that value is “covered up” and the equation can be solved, and both the x-intercepts and y-intercepts ca...

Drawing: Gradient-Intercept Method
Series: Graphs
In this video, students learn how to plot a straight line graph by identifying the gradient, and using it with the y-intercept.
In this programme, the teacher demonstrates how the table method is used in order to teach students how to plot straight lines onto a graph.

This clip investigates statistical data and data displays used in the advertising of a new gym. Follow along to find the inconsistencies in the statistics, graphs and pie charts, and discover more abo...

Join us on a fruit-slashing foray into the world of fractions. In this action-packed program, we slice and dice fruit into various fractions; adding, subtracting and further dividing plump fruit piece...

Exponential phenomena are at work all around us—from population growth to how long it takes for a bouncing ball to come to rest. This carefully paced program will not only introduce students to the ru...

Exponents and index laws can make manipulations of numbers simpler. In this clip, two situations are used to apply index laws to numerical expressions with integer indices. In the first situation, the...

This entertaining and informative programme explains all about exponents, the powers to which numbers are raised. Examining positive and negative indices, the uses and benefits of using exponents to e...

In this programme, students are taught how to find the external and internal angles of a regular polygon, using a standard formula.

In this video students learn to express a number as a product of its prime factors, using two methods; factor trees and the ladder method.

This video shows one of the methods used to solve a quadratic equation. Factorisation is one of the quickest and most popular methods used, and students are shown how to use it.

Our young presenter explores a variety of ways to represent and explain the techniques used in numerical and algebraic factorising.

Our narrator is helping to build a new playground. Her boss needs her to determine the area of different zones of the playground, some of which are composite shapes. Follow along as she works through...

This video shows students how to find the equation of a straight line by using the formula y=mx+c.
Finding the Gradient and Intercept of $y = mx + c$
Series: Algebra

In this programme, students learn how to rearrange the equations into the standard $y = mx + c$ formula, in order to easily identify the gradient and y-intercept of a straight line.

Formulating Differential Equations
Series: Integration

This video shows how to formulate differential equations from a series of statements and integrate these equations in order to obtain the answer asked for in the question.

Fractions: Adding and Subtracting
Series: Numbers

Students learn the basics of how to add and subtract fractions in this video. This includes fractions with a common denominator, how to add and subtract fractions by writing them with a common denominator...

Fractions: Adding and Subtracting Mixed Fractions
Series: Numbers

Continuing from "Fractions: Adding and Subtracting", this video furthers students knowledge of adding and subtracting fractions by using mixed numbers. The method used by the teacher uses improper fra...

Fractions: Adding and Subtracting Mixed Fractions (Alternative Method)
Series: Numbers

Continuing on from “Fractions: Adding and Subtracting” and “Fractions: Adding and Subtracting Mixed Fractions” this video shows students how to add and subtract mixed fractions using a faster, more ad...

Fractions: Cancelling Down
Series: Numbers

Cancelling down is the process of simplifying fractions. In this video, the teacher explains how to do this through a process of division.

Fractions: Dividing
Series: Numbers

In this clip, students are taught to interpret division as the inverse of multiplication, and divide integers and fractions by a fraction.

Fractions: Introduction and Equivalent
Series: Numbers

Students are introduced to the concept of fractions in this video. They learn to recognise when two fractions are equivalent and how to identify, recognise, find, and calculate equivalent fractions.

Fractions: Mixed to Improper and Improper to Mixed
Series: Numbers

In this clip, students are taught how to change a mixed number to an improper fraction and vice versa, using example questions.

Fractions: Multiplying
Series: Numbers

In this clip, students learn how to multiply fractions by integers and other fractions.

Fractions: Multiplying and Dividing Mixed Fractions
Series: Numbers

Continuing on from “Fractions: Multiplying” and “Fractions: Dividing”, this video demonstrates how students can solve multiplication and division fraction equations that involve mixed numbers.
Functions and Relations
Series: Algebra for Students

Functions and relations are important aspects of algebra. By showing how two sets of numbers are related, you can represent all types of real-world phenomena -- from Ferris wheels and roller coasters...

Geometric Constructions

This programme demonstrates elementary construction techniques involving plane shapes using a ruler, pencil, compass and protractor. It is essential viewing for any junior class about to embark upon a...

Geometric Transformations

This programme introduces the four common geometric transformations in interesting settings and in a way that is relevant to students. Translation, reflection, rotation and dilation are investigated a...

Geometry 2: Surface Area of Solids

This programme shows how to measure the dimensions of common 3D objects. The calculations needed to obtain their surface areas and volumes are also illustrated.

Graphing Distance and Time: A Runner's Story
Series: Numbers and Algebra

This video follows a runner graphing his running distance and speed. He explains what happened along the route that affected his speed, translating this information onto a graph and accounting for the...

Graphing Simple Parabolas and Circles
Series: Numbers and Algebra

This video begins with a short introduction of everyday applications of circles and parabolas. Next, basic parabolas and circles are graphed using quadratic equations. Ideal for reinforcing concepts.

HCF and LCM
Series: Numbers

In this video, the teacher demonstrates how to find the lowest common multiple (LCM) and highest common factor (HCF) of two numbers.

HCF and LCM using Prime Factors
Series: Numbers

This clip demonstrates how to find the highest common factor (HCF) and lowest common multiple (LCM) of large numbers using prime factors.

Histograms and Boxplots of Gym Membership

In this clip, histograms and boxplots are used to display the results of a study into the number of hours gym members use the gym each week. This clip introduces important terms and concepts including...

Histograms and Frequency Polygons
Series: Representing Data

This video presents how to draw a histograms using continuous data and using that how to draw a frequency polygon.

Histograms of Unequal Class Widths
Series: Representing Data

Histograms with unequal class widths differ from histograms with equal class widths in that the area rather than the height of each bar is used to display frequency. In this programme, students are ta...
Identifying Polygons
Series: Angles in Polygons

In this video, students are introduced to polygons and what shapes are polygons. These includes three different types of triangles, and six types of quadrilaterals, as well as other shapes.

Increasing and Decreasing Functions
Series: Differentiation

This video describes increasing functions, graphs with a positive gradient, and decreasing functions, graphs with a negative gradient. It shows how to evaluate and find the range of values in which a...

Index Notation and Prime Factors
Series: Numbers and Algebra

This video provides a short lesson on index notation and representing whole numbers as products of powers of prime numbers. Examples of raising base numbers to different powers are shown. Prime and co...

Integers: The Whole Thing

Integers are all around us and used for many different purposes. This programme explores the world of integers where we share a day in the life of the presenter who entertains us in her own quirky way...

Integrating 1/x and e^x
Series: Integration

This video shows how to obtain the integrals for 1/x and e^x functions.

Integrating Basic Trigonometric Functions
Series: Integration

This video shows how to obtain the integrals for basic trigonometric functions.

Integrating Functions of (ax + b)
Series: Integration

This video demonstrates how to integrate (ax + b) functions by using the reverse of the chain rule.

Integrating sin^2 (x), cos^2 (x) and tan^2 (x)
Series: Integration

This video shows how to obtain the integrals for sin squared, cos squared and tan squared.

Integration by Parts
Series: Integration

This video shows how to integrate by parts when the function involves a product of two functions that cannot be integrated through substitution.

Integration by Substitution
Series: Integration

This video shows how to obtain the integrals for complicated functions by first making a substitution.

Integration by Substitution: Non-Linear Substitution
Series: Integration

This video shows how to obtain the integrals for complicated functions with a non-linear substitution.

Integration Using Partial Fractions
Series: Integration

This video shows how to obtain the integrals for functions involving polynomials in the denominator by using partial fractions.
Interest, Loans and Credit
You want to buy a new bike, but you've only got half the money you need. You might consider a high-interest savings account. But how long would it take to save? And how much would you pay in bank fees...

Into the Negative Zone!: Working with Integers
Series: Mathemania Series 1
Our young presenter ventures fearlessly into the negative zone to learn how to add, subtract, multiply and divide positive and negative numbers.

Introducing Probability
Series: Mathemania Series 2
This program demonstrates experimental and theoretical probability. Looking particularly at: probability with, and without replacement; probabilities and their complements; representing events and pro...

Introducing Problem Solving
Series: Mathemania Series 2
This program is an excellent introduction to problem solving suitable for Middle School students.

Introducing Ratio and Proportion
Series: Mathemania Series 2
Using a range of real life scenarios, this programme provides an introduction to the fundamental concepts of ratio and comparison of quantities. These include: writing ratios, ratios and fractions, eq...

Introducing Statistics
Series: Mathemania Series 2
For Junior Secondary students, this program covers statistics and simple statistical manipulation as applied in everyday life.

Introducing Trigonometric Ratios
Trigonometric ratios have many practical uses in the building industry, engineering, astronomy and geography. This clip shows how to calculate sine, cosine and tangent for given angles in right-angled...

Investigating Population Survey Data
In this clip, multiple surveys investigating the number of times Australians visit the beach each week are conducted and analysed. Follow along as the means and medians are calculated for each survey....

Irrational Numbers: Pi and Pies
The clip explains how the irrational number Pi () is derived and provides an example of its practical application in calculating the area of different sized pie tins. It explores: how Pi is derived b...

Let's Get It Straight: Linear Equations and Their Graphs
Series: Mathemania Series 1
This program covers a review of gradient; equation of a line through the origin; lines with positive and negative gradients; equation of a line with a positive or negative y-intercept; domain and rang...

Line Graphs: Gradients and Midpoints
Series: Numbers and Algebra
This video follows a sprinter graphing her distance and speed for two separate sprints. The first sprint is at a constant speed, resulting in a straight line graph. In the second sprint, her graph ref...
### Linear Equations and Slope
**Series:** Algebra for Students  
2007  
E 00:24:19

Linear relationships are all around us. Join our hosts as they tackle linear equations and slope - two topics in algebra that go hand-in-hand. Through a series of real-world scenarios, see how a table...

### Linear Functions: An Introduction
**Series:**  
2009  
E 00:21:12

This programme is an excellent introduction to linear functions. Students, with the aid of "Sharpy the Pencil", learn to plot and sketch graphs from linear equations as well as deriving linear equation...

### Loci of One or Two Lines
**Series:** Loci  
2013  
E 00:07:29

This programme shows students how to find the loci of one ongoing or terminating line or two lines and how to apply this knowledge into practical questions.

### Loci of One or Two Points
**Series:** Loci  
2013  
E 00:04:58

The loci or locus is a line following a given rule. In this video, the teacher demonstrates how to find the loci of either one and two points.

### Mean of Frequency Data
**Series:** Statistical Averages  
2013  
E 00:04:58

In this video, students learn how to calculate the mean of data that is in a frequency table by using multiplication.

### Mean of Grouped Frequency Data
**Series:** Statistical Averages  
2013  
E 00:03:25

In this video, the teacher demonstrates how to estimate the mean for a set of grouped data by using a formula.

### Mean of Raw Data
**Series:** Statistical Averages  
2013  
E 00:04:10

In this programme, students are taught how to calculate the mean of raw data. Students also learn that although it commonly referred to as 'the average', it is simply one of the most common.

### Mean, Median and Outliers
**Series:**  
2015  
E 00:05:56

This clip explores the effect of outliers on measures of central tendency - mean and median. The lengths of time that swimmers stay underwater is collected, and mean and median values are calculated....

### Median and Mode of Frequency Data
**Series:** Statistical Averages  
2013  
E 00:03:49

In this programme, students learn how to find the median and mode of a data set that is presented in a frequency table.

### Median and Mode of Grouped Frequency Data
**Series:** Statistical Averages  
2013  
E 00:05:15

In this video, students are taught how to estimate the median of grouped data by using a frequency table and plotting the data on a graph. Students also learn how to estimate the modal class through t...

### Median and Mode of Raw Data
**Series:** Statistical Averages  
2013  
E 00:04:41

In this programme, students are taught what the median of data is and how to calculate it by organising raw data or through a formula. Students also learn about the mode of a data set, and how to find...

### Metric Units: Length, Mass and Capacity
**Series:**  
2011  
E 00:14:53

You can use metric units to measure anything from a grain of sand to the whole wide world! This fun program takes us from the beach to the kitchen to explain the metric units used to measure length,...
Midpoint between Two Coordinates
Series: Coordinates
This video shows students how to find the midpoint between two coordinates for intervals, 2D and 3D shapes.

Multiple Integration by Parts
Series: Integration
This video demonstrates how to do integration by parts more than one time so as to obtain a function that can be integrated more easily.

Multiples
Series: Numbers
This video allows students to understand the term ‘multiple’ in context and teaches them how to use it.

Multiplying by a Constant
Series: Transformation of Graphs
This video shows students what multiplying an equation with a constant does to a graph, whether it is inside or outside the function brackets.

Naming and Measuring Angles
Series: Mathemania Series 3
This program provides students with a lively introduction to key concepts involved with angles, such as how we define and write information about an angle, mathematical notation for rays, line segment...

Negative: Reflections
Series: Transformation of Graphs
This video informs students of how a negative number can transform a graph depending on whether it is -f(x) or f(-x).

Number Patterns: Finding the nth Term
Series: Algebra
In this video, students learn to use algebra to find and describe the nth term. The teacher then uses this to find the general term (nth term) of a linear sequence.

Number Patterns: Position to Term Method
Series: Algebra
This programme aims to teach students how to describe the position-to-term rule, generate terms of a sequence, find a term of a sequence from its position, and how to find a term given its position an...

Number Patterns: Square Numbers
Series: Algebra
This programme shows students how to recognise and apply square numbers using a visual demonstration.

Number Patterns: Term by Term Method
Series: Algebra
This video aims to teach students how to use the term by term method to find the subsequent terms in a linear sequence.

Operations with Algebraic Fractions
This clip applies the four operations to simple algebraic fractions with numerical denominators. It begins by using the example of pizza to add and subtract fractions, and determine lowest common deno...

Parallel and Perpendicular Lines
This clip demonstrates how to solve problems involving parallel and perpendicular lines. Methods for finding the gradient (slope) and equations of parallel and perpendicular lines are applied to diffe...
Parallel Lines
Series: Graphs
This video shows students how parallel lines on a graph have the same gradient, and how to identify which lines are parallel to each other using their equations.

Part 1: Symmetry and Angles
Series: Geometry of Groove
This video explores the application of geometrical concepts and their critical role in the contemporary music industry. Modern instruments, powerful sound systems and complex recording technology all...

Part 2: Triangles and Polygons
Series: Geometry of Groove
The application of geometrical concepts is critical in the contemporary music industry. Modern instruments, powerful sound systems and complex recording technology all rely on geometry for the success...

Patterns and Formulas
Series: Algebra for Students
Patterns are used to make predictions every day. Formulas are extremely important in the world of algebra. From developing a formula that represents a real-world scenario to building a table of values...

Perfect Squares and Square Roots
Series: Numbers and Algebra
This video investigates and uses square roots of perfect square numbers to create and solve equations. Viewers will learn how to determine the square roots of perfect squares, and determine if a numbe...

Perpendicular Bisector of a Line
Series: Constructing Angles
This clip shows students how to create a perpendicular bisector of a line using a compass and a ruler.

Perpendicular Lines
Series: Graphs
This programme shows students how to identify which lines are perpendicular through their gradients.

Pictograms
Series: Representing Data
Pictograms are a way of representing data using drawings. Students are shown how to use a key to read a pictogram, and how to draw one based on a data set.

Pie Charts: Drawing and Reading
Series: Representing Data
In this programme, students are taught how to interpret and construct pie charts by using angles as a proportion of a circle.

Plane and Simple: Areas of Polygons and Circles
Series: Representing Data
This programme contains clear, simple derivations of area formulae for the common geometric shapes: rectangle, square, parallelogram, rhombus, trapezium, triangle and circle.

Polynomials
Series: Algebra for Students
When you are diving into algebra, it is a good idea to know how to recognise and work with polynomials. Join our hosts as they introduce students to the vocabulary associated with polynomials and demo...
Concepts addressed in Solving for X: Pre-Algebra I, Volume 1: Infinite Fractions - Is that Rachael Ray? Martha Stewart? Good Heavens, its Bill Nye, cooking up some fractions. Well start out in the k...

Prime Factors
Series: Numbers
Students learn how to define prime factors and find them. Students will also learn how to express numbers in terms of their prime factors.

Primes
Series: Numbers
In this clip, students are taught how to identify a prime number using the two factor rule.

Probability
Series: Maths Tutorials
An on-screen probability tutorial with presenter Jacquie Hargreaves.

Product of Primes, HCF, and LCM
Series: Numbers
This programme shows students how to find the product of prime numbers, as well as the HCF and LCM by using prime factors.

Proving Congruent Triangles
While building a barbeque shelter, our narrator's boss puts her geometry skills to the test by asking her to mathematically prove that five triangular roof trusses are congruent triangles. Follow along...

Pythagoras' Theorem in 3 Dimensions
Series: Geometry
This video shows students how to apply Pythagoras' theorem to find the length of internal diagonals in three dimensional shapes.

Pythagoras' Theorem: An Introduction
In this programme, we discover Pythagoras' Theorem and see how it is used to solve real world problems by finding unknown values in right angled triangles. And who better to introduce and demonstrate...

Quadratic Formula
Series: Solving Quadratic Equations
This programme shows another method of solving quadratic equations through using the quadratic formula. Students are taught the quadratic formula and how to apply it to questions.

Quadratic Functions
Series: Algebra for Students
Whether it's football, fireworks or finding the zeroes, it is important to know how to recognise quadratic functions by their parabolas and squared terms. Join our hosts on an in-depth exploration of...

Quartiles and Interquartile Range: Frequency Data
Series: Data Handling
This programme furthers students knowledge of range and interquartile range by showing them how to apply it to frequency data, and how to find the interquartile range using a graph plotted from a freq...

Quartiles and Interquartile Range: Raw Data
Series: Data Handling
This video introduces students to the concept of quartiles, what an interquartile range is, and how to find the median using it.
**Rates of Change**  
Series: Differentiation  
2013 E 00:06:45  
The video shows how to approach questions relating to the rate of change using differentiation and evaluate such questions at a particular value.

**Rational Numbers: We Are Proportional**  
Series: Mathemania Series 4  
2007 E 00:24:40  
This entertaining programme provides students with an active introduction to the key concepts relating to rational numbers. Areas covered include defining rational numbers as the ratio of two integers...

**Relative Frequency of Events**  
2015 E 00:04:42  
This clip explores the probability of seeing Australian animals on a wildlife tour and uses relative frequency to describe the chances of seeing particular animals. Collected data is displayed in two-...

**Reverse Percentages**  
Series: Numbers  
2013 E 00:04:31  
Students learn to use an inverse operation to solve percentage problems. This video presents the Unitary Method as a way of solving these problems.

**Reverse Percentages (Alternative Method)**  
Series: Numbers  
2013 E 00:02:15  
In this video, students learn to use an alternative inverse operation to solve percentage problems.

**Roots: The Radical Idea**  
Series: Mathemania Series 4  
2007 E 00:28:50  
In this entertaining program, we cover an introduction to roots and radicals; explore how roots can be simplified: carry out some operations with radicals; examine methods of approximation of roots; a...

**Rotational Symmetry**  
Series: Geometry  
2013 E 00:04:29  
In this video, students are taught to recognise rotational symmetry, to find the order of rotational symmetry and to complete diagrams to a given order of rotational symmetry.

**Rounding to the Nearest 10, 100 and 1000**  
Series: Numbers  
2013 E 00:02:57  
In this clip, students learn to round whole numbers to any given power of 10, so students learn how to round numbers to the nearest 10, 100 and 1000.

**Scale Factor Enlargement: Negative Values**  
Series: Geometry  
2013 E 00:07:40  
This programme shows students how to enlarge or reduce the scale factor of a shape by a negative value and plot it on a graph.

**Scale Factor Enlargement: Positive Values**  
Series: Geometry  
2013 E 00:11:24  
This programme shows students how to enlarge or reduce shapes in size and plot these shapes on graphs using coordinates.

**Scatter Graphs**  
Series: Representing Data  
2013 E 00:05:44  
This programme demonstrates to students how to read and draw a scatter graph. It also explains what correlation is and how it is represented on the graph.
Scatter Plots and Gym Training

In this clip, a series of scatterplots are used to show how regular gym attendance has an effect on variables such as resting heart rate, feelings of well-being and TV viewing habits. The data is coll...
Solving Linear Equations
Reviewing a variety methods for solving equations, including guess, check and improve, the balance method and backtracking, the program takes students through the process of finding a numerical soluti... 2011 E 00:23:42

Solving Quadratic Equations Graphically
Series: Solving Quadratic Equations
This video shows students how to solve quadratic equations graphically as opposed to algebraically. 2013 E 00:05:18

Solving Quadratic Equations in Cricket and Rowing
Series: Numbers and Algebra
Our presenter applies algebraic knowledge of quadratic equations to two sports events. First, he determines the height of a batted cricket ball and the amount of time it is in the air. Next, he determ... 2014 E 00:05:02

Spherical Geometry and Navigation
We follow the crew of a 30,000 tonne container ship as they navigate their way around the globe. Along the way we discover key geometry and navigational concepts, such as: the Earth as a sphere, great... 2001 E 00:20:21

Squares, Cubes and Powers of Number
Series: Numbers
This video teaches the basic concept of what a power is and the correct notation and wording used, through the use of square roots and cube roots. 2013 E 00:04:25

Standard Index Form: Calculations
Series: Numbers
Continuing on from ‘Standard Form: The Basics’, this video uses standard form in calculations involving multiplication and division. 2013 E 00:03:23

Standard Index Form: The Basics
Series: Numbers
Through this video, students come to understand standard form and its use of positive and negative indices. 2013 E 00:04:52

Statistics: Sampling, Surveying and Data Analysis
In this dynamic program, our presenter wants to make a YouTube music video for her best friend's band, but they can't agree on which song to do! The solution: survey the target market - their friends... 2011 E 00:18:44

Stratified Sampling
Series: Data Handling
This video explains to students what stratified sampling is, and demonstrates how to take a stratified sample of a population. 2013 E 00:03:47

Substituting Values in Formulae
This clip demonstrates the importance of algebra and mathematical formulae in solving everyday problems. Working through a series of real-life examples, our narrator substitutes values into formulas t... 2014 E 00:05:17

Surds: Rationalising
Series: Numbers
Rationalising surds means to remove the root from the denominator of a fraction. This video shows students how to rationalise surds through a variety of questions. 2013 E 00:06:04

Surds: Rules and Simplifying
Series: Numbers
In this programme, students are able to learn about how to simplify surds when multiplying, dividing, adding or subtracting them and the rules that accompany them. 2013 E 00:05:49
Survey Data: Collecting and Displaying

In this clip, the results of student surveys are collated into tables and means are calculated. Students are asked to rate a music genre from 1 to 5, and in a separate survey, are asked to identify th...

Systems of Linear Equations
Series: Algebra for Students

Join our hosts as they tackle many real-life problems by using systems of linear equations! See how these systems can have zero, one or many common solutions. In the process of finding these solutions...

Taking a Chance: Key Probability Concepts

This programme is an odds-on favourite to make understanding probability a lot of fun! Set in the wonderful world of cards, coins and dice, this engaging programme introduces the basic concepts of pro...

Tangent and Normal to a Curve
Series: Differentiation

This video shows how to obtain the equations of the tangent and normal to a curve using differentiation.

That's a Bit Steep: All about Gradients
Series: Mathemania Series 1

The program covers positive and negative gradients, ‘Rise over Run’ formula, revision of Cartesian coordinates, and the use of coordinates to calculate rise, run and hence gradient.

The Area between a Curve and the x Axis
Series: Integration

This video shows how to obtain the area between a curve and the x axis using integration and definite integrals.

The Area between a Curve and the y Axis
Series: Integration

This video shows how to obtain the area between a curve and the y axis using integration and definite integrals.

The Area between a Line and a Curve
Series: Integration

This video shows how to obtain the area between a line and the curve using integration and definite integrals.

The Area between Two Curves
Series: Integration

This video shows how to obtain the area between two curves using integration and definite integrals.

The Chain Rule
Series: Differentiation

The video describes the chain rule, a rule used in differentiation to find the derivatives of ‘composite functions’.

The Exponential Function
Series: Maths Tutorials

This maths tutorial explains the exponential function.

The Product Rule
Series: Differentiation

The video describes the product rule, a rule that is used to differentiate problems where one function is multiplied by another.
The Pythagorean Theorem and Right Triangles
Series: Algebra for Students
Pythagorean Theorem is a powerful tool which people have used for centuries - and at its heart is the right triangle. Join our hosts as they investigate the relationship between a right triangle’s leg...

The Quotient Rule
Series: Differentiation
The video describes the quotient rule, a rule that is used for differentiating problems where one function is divided by another.

The Reciprocal Rule
Series: Differentiation
The video describes the reciprocal rule, a method in differentiation that can be used to find the derivative of a function that is the reciprocal of a differentiable function.

Three Dimensional
Series: Coordinates
In this video, students learn about how to find three dimensional coordinates which involve coordinates in three planes.

Time: Understanding and Calculating World Time
This program examines how time zones work and how the difference in time between different regions is calculated. This program defines longitude and explains the mathematical relationship between longi...

Triangles
Series: Constructing Angles
In this video, the teacher shows students how to construct a triangle when there is only a limited amount of information provided. She demonstrates three scenarios that students are likely to encounter...

Triangles and Quadrilaterals
Series: Mathemania Series 3
This programme illustrates the properties of triangles and quadrilaterals in a bright, informative and logical way. These shapes are found in architectural and constructional contexts. Their propertie...

Trigonometric Functions
Series: Maths Tutorials
This maths tutorial explains the trigonometric function.

Two Tangents from a Point to a Circle Are Equal
Series: Circle Theorems
Another circle theorem involves two tangents that come from the same point. Those two tangents are equal and symmetrical. The video demonstrates how this theorem can be used to solve problems.

Understanding Ratio and Proportion
This programme explores ratio and proportion with the aid of real world practical examples. From mixing paint to using basic ratio and proportion to estimate time, students will be engaged and enter...

Variables, Expressions, and Equations
Series: Algebra for Students
The "power" of algebra. What does that mean? Students will discover how algebra provides a way to organise patterns and represent real-life scenarios as well as abstract ones so that they can think ab...
Volumes of Revolution
Series: Integration

This video shows how to use integration to find the volume of a solid with a circular cross-section.