

Year 10 Foundation | Knowledge Organiser | Term 1

Index Laws

1	Square number	The number you get when you multiply a number by itself
2	Square root	The number you multiply by itself to get another number
3	Cube number	The number you get when you multiply a number by itself and itself again
4	Cube root	The number you multiply by itself and itself again to get another number
5	Powers of	The powers of a number are that number raised to various powers
6	Multiplication index law	When multiplying the same base, add the powers
7	Division index law	When dividing with the same base, subtract the powers
8	Brackets index laws	When raising a power to another power, multiply the powers together
9	Negative powers	Performs the reciprocal
10	Fractional powers	The denominator of the fractional power acts as the root. The numerator of a fractional power acts as a normal power

Brackets

1	Expand a single bracket	Multiply what is one the outside of the brackets by everything on the inside
2	Expand and simplify	Expand each bracket and then collect like terms
3	Expand double brackets	Each term in the first bracket is multiplied by all the terms in the second bracket
4	Quadratic	Has an x^2 term in it
5	Factorise an expression	Divide an expression by its highest common factor and put it into brackets
6	D.O.T.S.	Difference of two squares $Aa^2-b^2=(a+b)(a-b)$
7	Factorise a quadratic	Put into two brackets

Inequalities

1	Inequality	Two values are not equal
2	Open circles	Are used for numbers that are less than or greater than
3	Closed circles	Are used for numbers that are less than or equal or greater than or equal
4	$X > 2$	Means x is greater than 2
5	$X < 2$	Means x is less than 2

Equations and Formulae

1	Variable	A letter in an algebraic expression
2	Coefficient	How many of the variable you have
3	Expression	A mathematical statement written using symbols, numbers or letters; no equal sign
4	Collecting like terms	Adding and subtracting terms if they have the same letter
5	Formula	Shows the relationship between two or more variables
6	Substitution	Replace letters with numbers
7	Writing formulae	Substitute words for letters in the question
8	Solve	Find the answer of something
9	Inverse	Opposite
10	Rearranging formula	Use inverse operations on both sides of the formula until you find the expression for the letter

Sequences

1	Sequence	A set of numbers that follows a pattern
2	Term	Each value in a sequence is called a term
3	Position	The place in the sequence
4	Term-to-term rule	The rule to get from one term to the next
5	Nth term	The rule to work out any term from its position
6	Linear sequence	A number pattern with a common difference
7	Fibonacci sequence	A sequence where the next number is found by adding up the previous two terms
8	Geometric sequence	A sequence when the term-to-term rule is multiply or divide
9	Quadratic sequence	A sequence that involves square numbers
10	Triangular numbers	The sequence which comes from a pattern of dots that form a triangle 1, 3, 6, 10

Distance-time graphs

1	Time	On the x axis
2	Distance	On the y axis
3	Speed	Distance ÷ time
4	Speed	Gradient of the line
5	Straight line	Travelling at a constant speed
6	Horizontal line	Object is stationary
7	Positive gradient	Object is moving away from the start point
8	Negative gradient	Object is moving towards the start point
9	Steeper gradient	Moving faster
10	Average speed	Total distance ÷ total speed

Non-linear graphs

1	Quadratic graph	A U shaped curve called a parabola, of the form $y=x^2$
2	Cubic graph	Of the form $y=x^3$
3	Reciprocal graph	Of the form $y=1/x$, has asymptotes
4	Asymptote	A straight line that a graph approaches but never touches
5	Exponential graph	Of the form $y=2^x$, where the number is the base

Straight line graphs

1	Midpoint of a line	Add the x coordinates and divide by 2, add the y coordinates and divide by 2
2	Axes	A fixed reference line on a grid to help show the position of coordinates
3	Linear graph	Straight line graph
4	$Y=mx+c$	M is the gradient C is the y-intercept
5	Gradient	How steep the line is
6	Gradient	$m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$
7	Parallel lines	Have the same gradient
8	Perpendicular lines	The product of the gradients will always equal -1
9	Perpendicular lines	The gradient of perpendicular lines is the negative reciprocal
10	Reciprocal	Found by doing 1 divided by the number