

Y7

ALGEBRAIC NOTATION & SUBSTITUTION,
SEQUENCES (DIAGRAMS & NUMBERS

SOLVE ONE STEP EQUATIONS &
SIMPLIFYING, PLACE VALUE

ORDERING INTEGERS, DECIMALS &
FRACTIONS, POWERS OF 10, USING NUMBER
SKILLS

MATHS LEARNING JOURNEY

USING ANGLE FACTS, SETS &
VENN DIAGRAMS

CALCULATING WITH FRACTIONS &
MIXED NUMBERS, CONSTRUCTING

FRACTIONS & PERCENTAGES OF AMOUNTS,
DIRECTED NUMBER

PROBABILTY, TYPES OF
NUMBERS, CONJECTURES

Y8

RATIO & SCALE, PROPORTION,
MULTIPLY & DIVIDE FRACTIONS

STRAIGHT LINE GRAPHS, SCATTER
GRAPHS, FRACTIONS & PERCENTAGES

NUMBER SENSE, AREA OF
TRAPEZIUM AND CIRCLES

INDICES, STANDARD FORM,
ANGLE PROBLEMS

PROBABILTY, EXPAND & FACTORISE,
SOLVE EQUATIONS, NTH TERM

DATA, SYMMETRY, MEASURES OF
LOCATION & COMPARISONS

Y9

EQUATIONS, CONJECTURES,
STRAIGHT LINE GRAPHS

3D SHAPES, NUMBER PROBLEMS,
CONSTRUCTIONS & CONGRUENCE

RATIO & PROPORTION,
ENLARGEMENTS & SIMILARITY

ROTATIONS & TRANSLATIONS,
PYTHAGORAS' THEOREM

PERCENTAGES, DEDUCTION,
MATHS & MONEY

RATES, PROBABILITY, ALGEBRAIC
REPRESENTATION

Y10

NON-CALCULATOR METHODS,
INDICES & ROOTS, CIRCLES

EQUATIONS, INEQUALITIES, DATA,
EXPAND & FACTORISE

PROBABILITY, REARRANGING
FORMULAE

CONGRUENCY, SIMILARITY &
ENLARGEMENT, RATIO & FRACTIONS

ANGLES & BEARINGS, TRANSFORMATIONS,
PERCENTAGES

TRIGONOMETRY, MULTIPLICATIVE
RELATIONSHIPS

COLLECTING AND USING DATA
LOCI

Y11

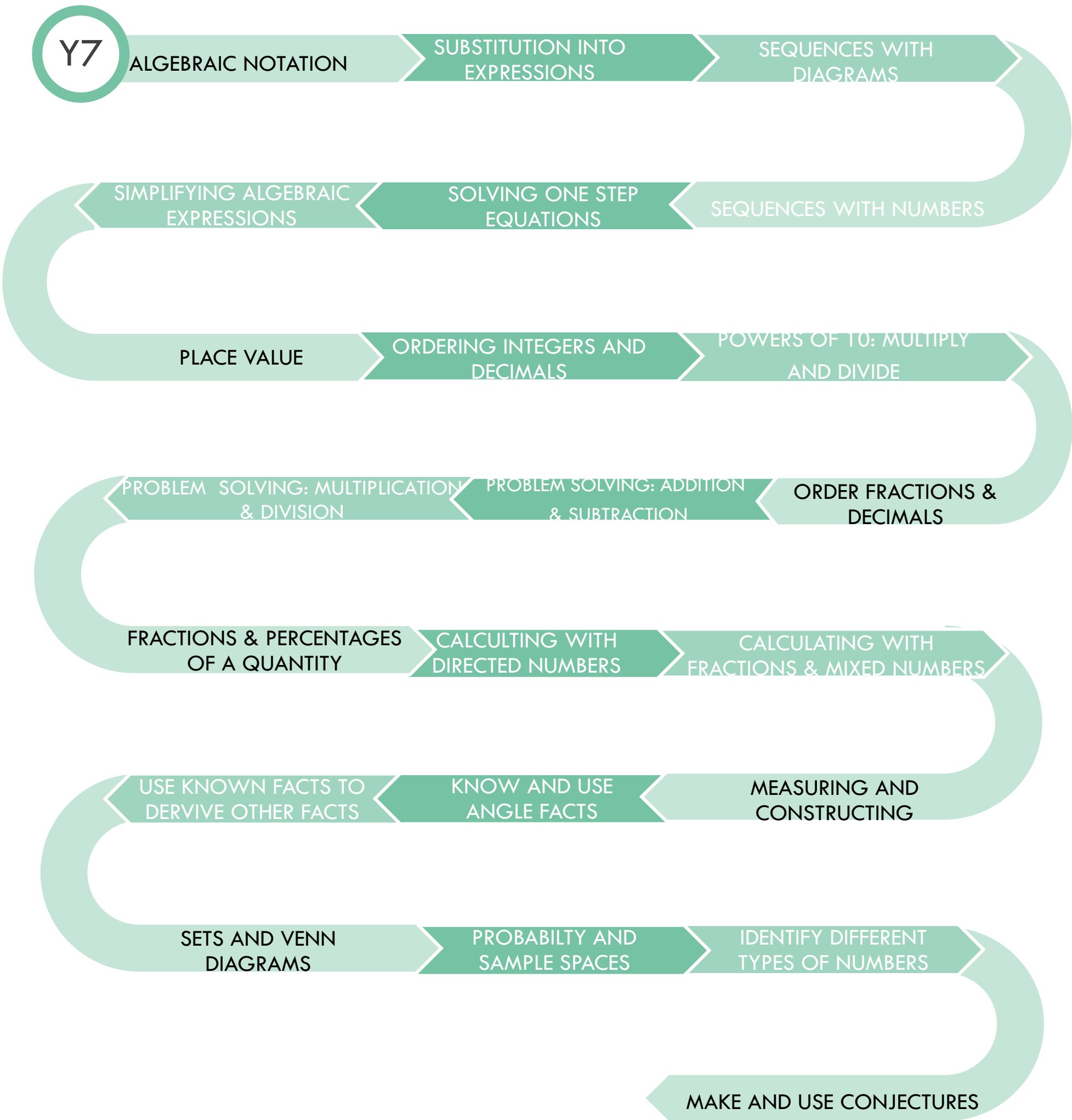
USING DATA, CONSTRUCTIONS,
SEQUENCES, LINEAR GRAPHS

REVISION AND EXAM PREPARATION

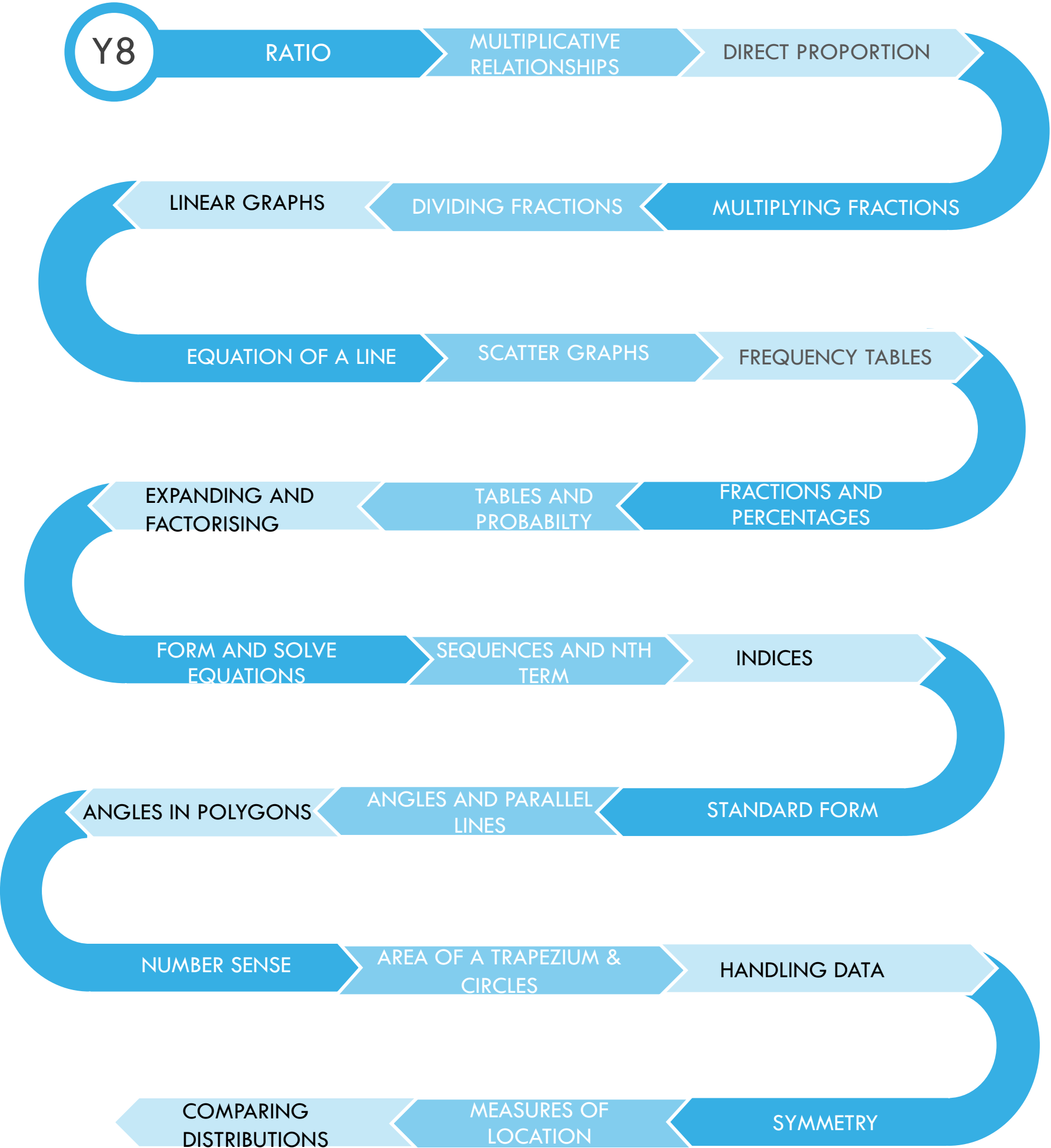
VECTORS, NON-LINEAR GRAPHS,
FUNCTIONS, USING GRAPHS

EXPRESSIONS, TRIGONOMETRY,
SIMULTANEOUS EQUATIONS

YEAR 7 MATHS LEARNING JOURNEY



YEAR 8 MATHS LEARNING JOURNEY



YEAR 9 MATHS LEARNING JOURNEY

Y9

ONE AND TWO STEP
EQUATIONS

ONE AND TWO STEP
INEQUALITIES

TESTING CONJECTURES

SURFACE AREA
& VOLUME

NETS, PLANS AND
ELEVATIONS

STRIAGHT LINE
GRAPHS

PROBLEM SOLVING:
INTEGERS AND DECIMALS

CALCULATING WITH
FRACTIONS

LOCI & CONSTRUCTIONS

DEDUCTION

PERCENTAGES PROBLEMS

CONGRUENT SHAPES

MATHS AND MONEY

ROTATION

TRANSLATION

PROPORTION

RATIO

PYTHAGORAS'
THEOREM

ENLARGEMENT

SIMILARITY

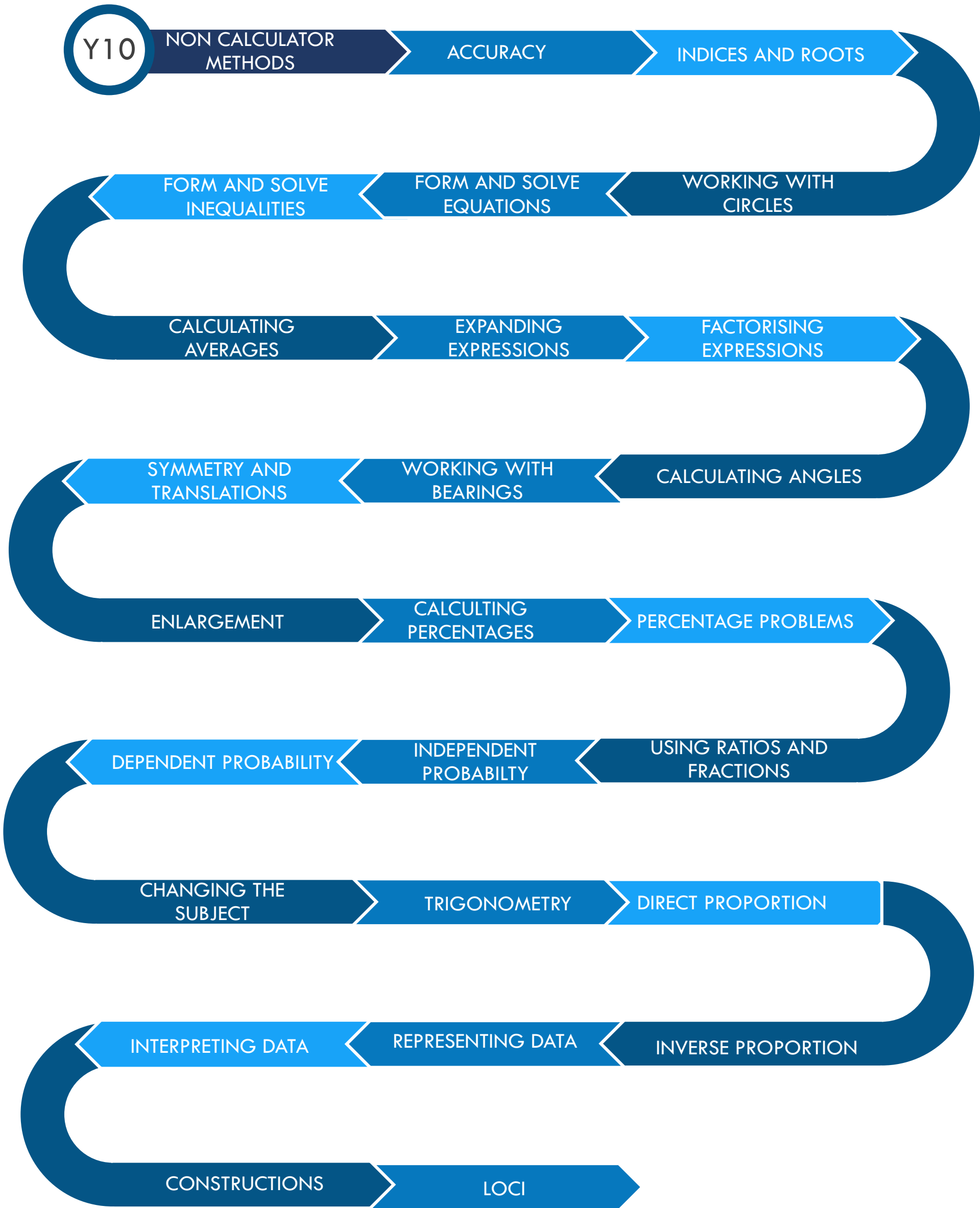
RATES

ALGEBRAIC REASONING

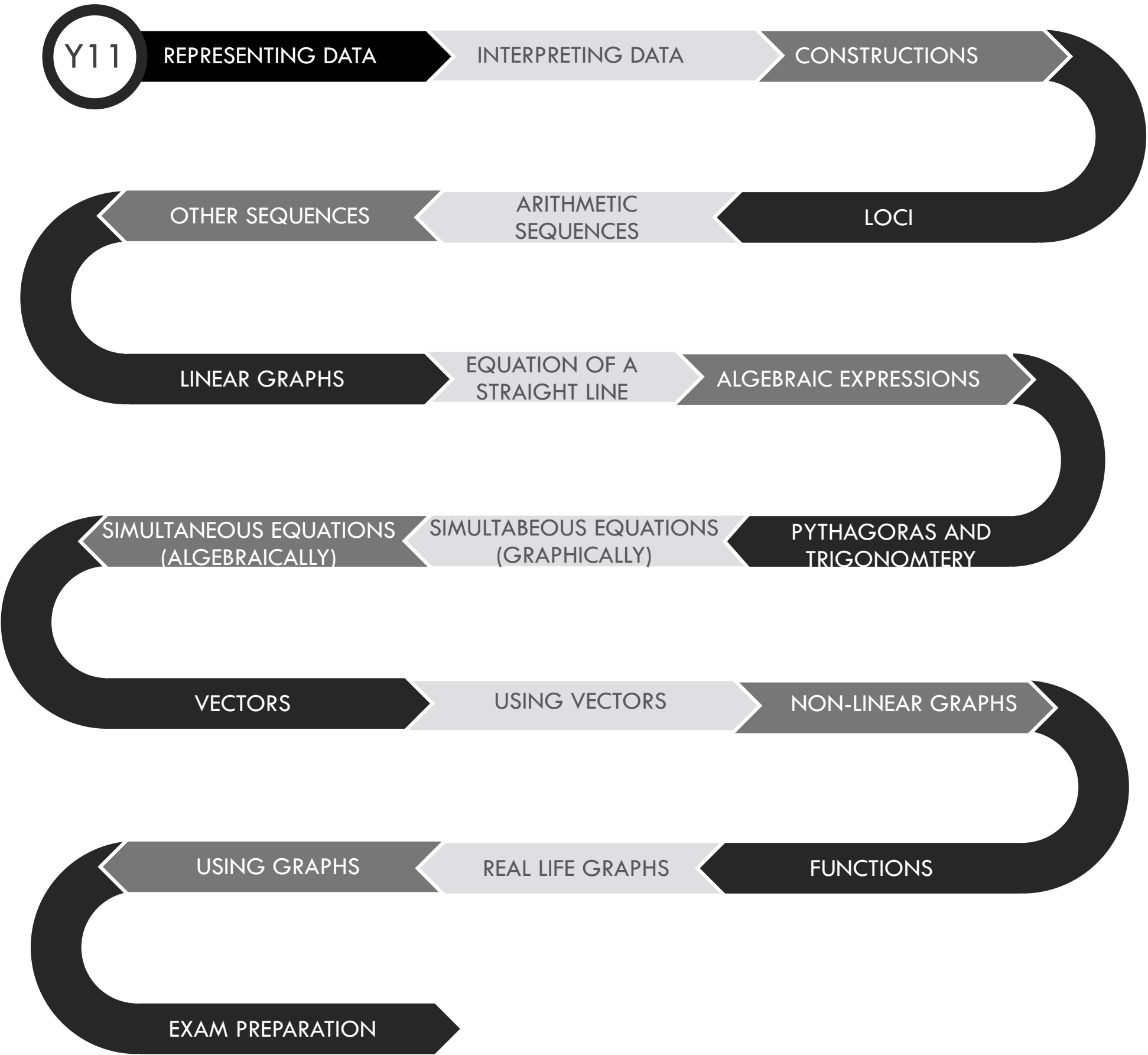
INDEPENDENT
PROBABILITY

PROBABILITY: EXPECTED
OUTCOME

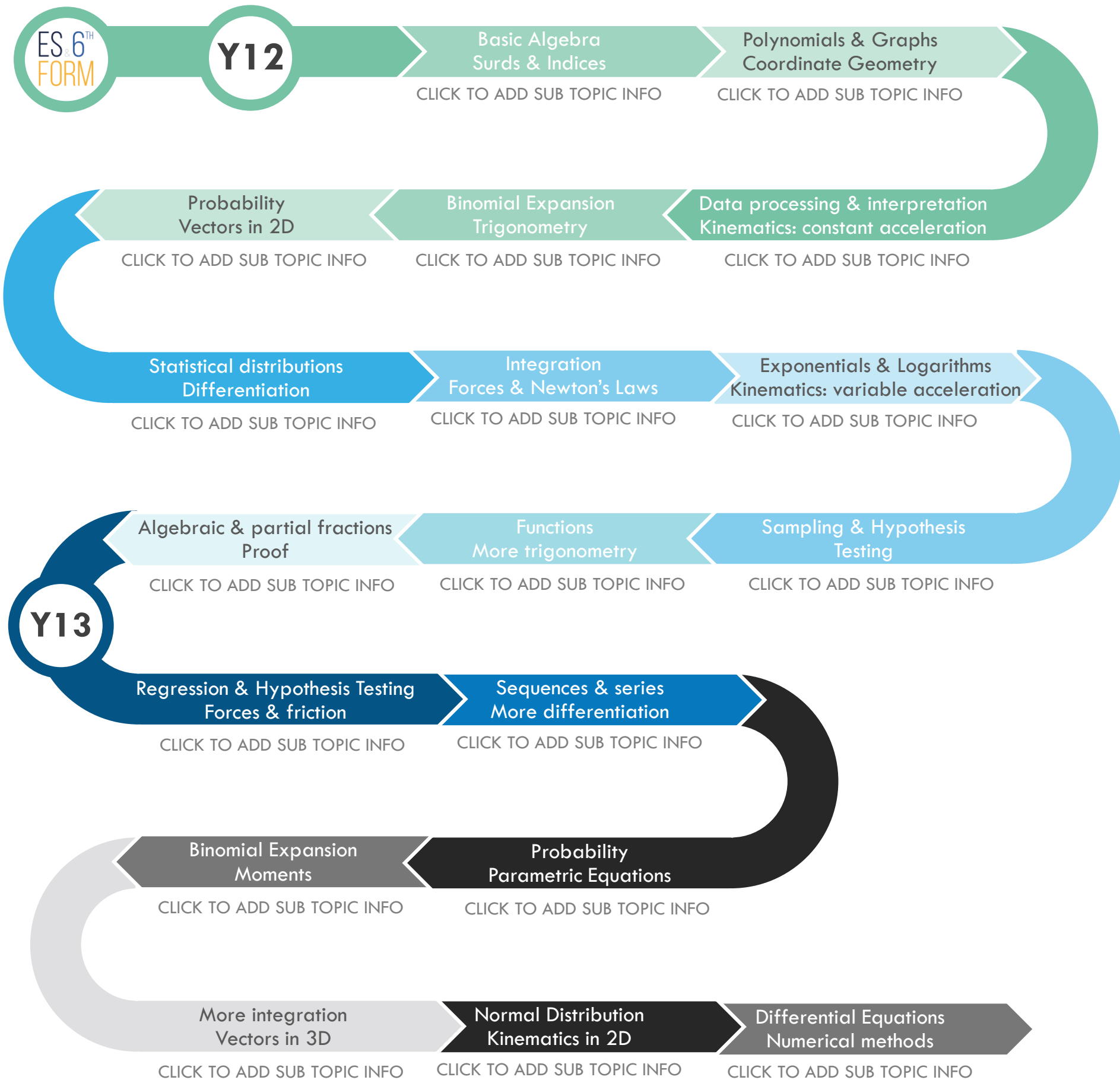
YEAR 10 MATHS LEARNING JOURNEY



YEAR 11 MATHS LEARNING JOURNEY



A LEVEL MATHS LEARNING JOURNEY



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YEAR 12 MATHS LEARNING JOURNEY

Y12

Basic Algebra

Quadratic and simultaneous equations. Inequalities.

Surds & Indices

Rules for indices. Simplifying with surds. Rationalising.

Polynomials & Graphs

Algebraic division. Factor theorem. Graphs of polynomials and transformations.

Kinematics: constant acceleration

Travel graphs, constant acceleration formulae and vertical motion under gravity.

Data processing & interpretation

Statistical diagrams. Averages and measures of spread. Comparisons of data. Large data set.

Coordinate Geometry

Distances, midpoints, gradients, lines and circles.

Binomial Expansion

Expansion of $(a+b)^n$ where n is a positive integer.

Trigonometry

Common graphs. Equations. Sine and cosine rules. Identities and proof.

Probability

Tree diagrams, Venn diagrams. Independent events. Mutually exclusive events.

Differentiation

Basic definitions. 1st principles. Gradients on curves. Tangents, normals and stationary points. Rates of change.

Statistical Distributions

Discrete distributions and associated probabilities. The binomial distribution and conditions for its use.

Vectors in 2D

Definitions. Magnitude and direction of vectors. Geometrical problems. Links to mechanics.

Integration

Introduction as reverse of differentiation. Areas under curves.

Forces & Newton's Laws

Force diagrams. Resultant forces. Newton's laws of motion. Connected particles including lifts, pulleys and towing.

Exponentials & Logarithms

Definitions. Graphs of the form $y = a^x$. Logarithmic and exponential equations. Reduction to a linear form.

AS revision

Full focus on revision for the summer exams.

Sampling & Hypothesis Testing

Sampling techniques and their strengths and weaknesses. Hypothesis testing with the binomial distribution.

Kinematics: variable acceleration

Use of differentiation and integration in displacement/velocity/acceleration problems.

More Trigonometry

Radians. Sectors and arcs. Small angle approximations. Sec, cosec and cot functions. Addition and double angle formulae. Related problems.

Functions

Domain, range, composite and inverse functions. Modulus functions. Combined transformations.

Proof

Conjecture and counter-examples. Proof by deduction, exhaustion or contradiction.

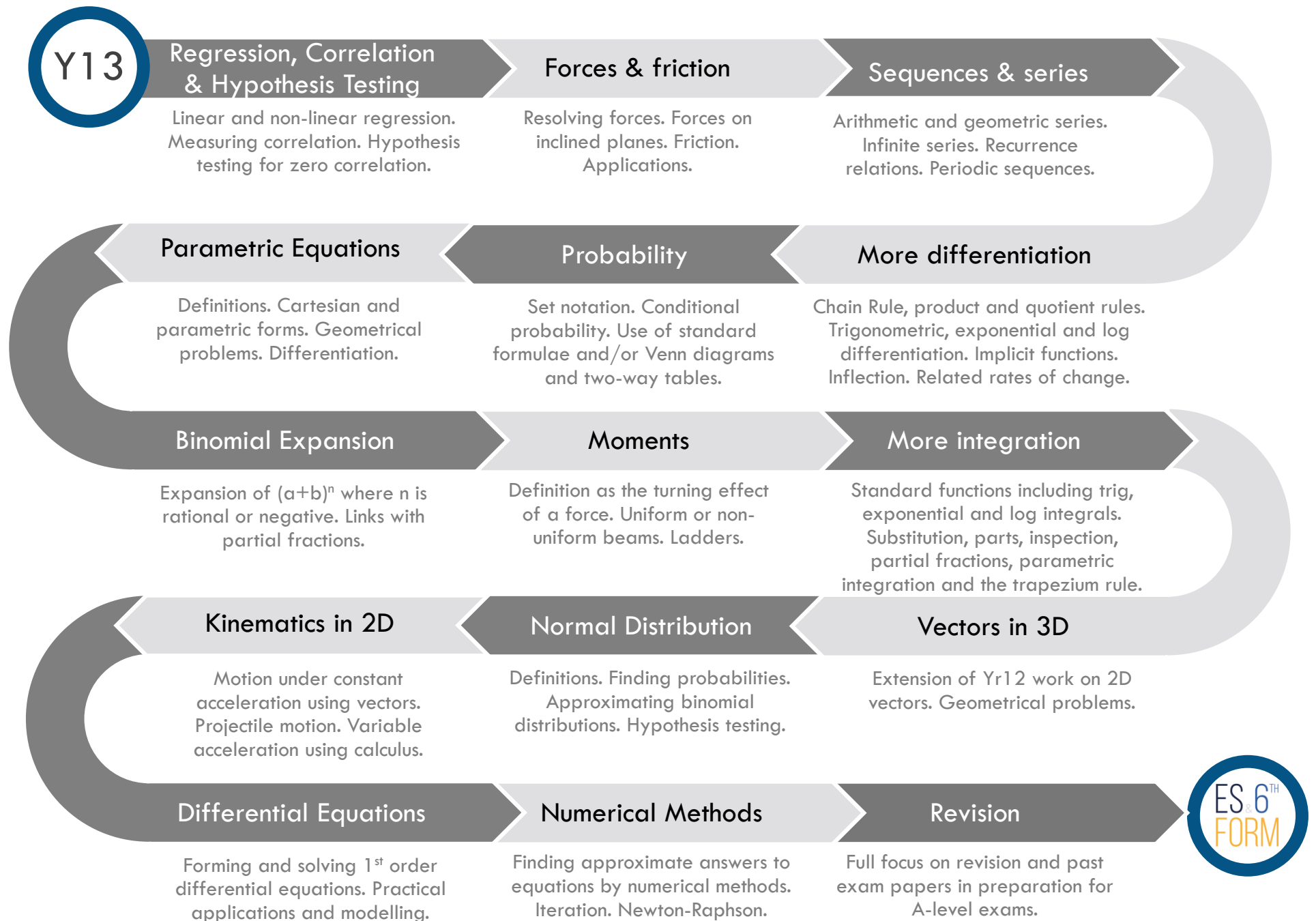
ES 6TH
FORM

Algebraic & partial fractions

Proper and improper fractions. Separating into partial fractions.

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YEAR 13 MATHS LEARNING JOURNEY



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A LEVEL MATHS WITH FURTHER MATHS LEARNING JOURNEY



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YEAR 12 MATHS WITH FURTHER MATHS

LEARNING JOURNEY



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YEAR 13 MATHS WITH FURTHER MATHS LEARNING JOURNEY

Y13

More Integration

Standard functions including trig, exp and log integrals. Substitution, parts, inspection, partial fractions, parametric integration and the trapezium rule.

Parametric Equations

Definitions. Cartesian and parametric forms. Geometrical problems. Differentiation.

Further Algebra

Method of differences.
Maclaurin series

Sequences and Series

Arithmetic and geometric series. Infinite series. Recurrence relations. Periodic sequences.

Vectors in 3-D

Extension of Yr12 work on 2D vectors. Geometrical problems

More Complex Numbers

Exponential form. De Moivre's theorem. Applications to trigonometric. Roots of unity.

Polar Coordinates

Cartesian and polar conversion. Area enclosed by a polar curve.

Binomial Expansion

Expansion of $(a+b)^n$ where n is rational or negative. Links with partial fractions.

Further Calculus

Improper integrals. Mean value. Using partial fractions. Inverse trigonometric integration. More volume of revolution.

Moments

Definition as the turning effect of a force. Uniform or non-uniform beams. Ladders.

Numerical Methods

Finding approximate answers to equations by numerical methods. Iteration. Newton-Raphson.

Forces and Friction

Resolving forces. Forces on inclined planes. Friction. Applications.

Kinematics in 2D

Motion under constant acceleration using vectors. Projectile motion. Variable acceleration using calculus.

Differential Equations

Forming and solving 1st order differential equations. Practical applications and modelling.

Hyperbolic Functions

Definitions. Graphs. Logarithmic form. Calculus with hyperbolics.

Travelling Salesperson

Nearest neighbour algorithm. Upper and lower bounds.

Graphs and Networks

Planarity algorithm. Route inspection with more than 4 odd nodes.

Momentum & Impulse (2D)

Using vectors for momentum and impulse problems.

Elasticity

Hooke's law and elastic potential energy. Work-energy principle and problem-solving in context.

Further Differential Equations

1st and 2nd order differential equations. Applications to kinematics including harmonic motion. Coupled 1st order simultaneous equations.

Simplex Algorithm

Formulating. Simplex method. Integer solution problems. Two-stage simplex method. Big-M.

Revision

Full focus on revision and past exam papers in preparation for A-level exams.

Critical Path Analysis

Resource histograms. Scheduling diagrams.

Elastic Collisions (2D)

Oblique impacts between spheres or between spheres and surfaces. Use of scalar products.

ES & 6TH
FORM

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