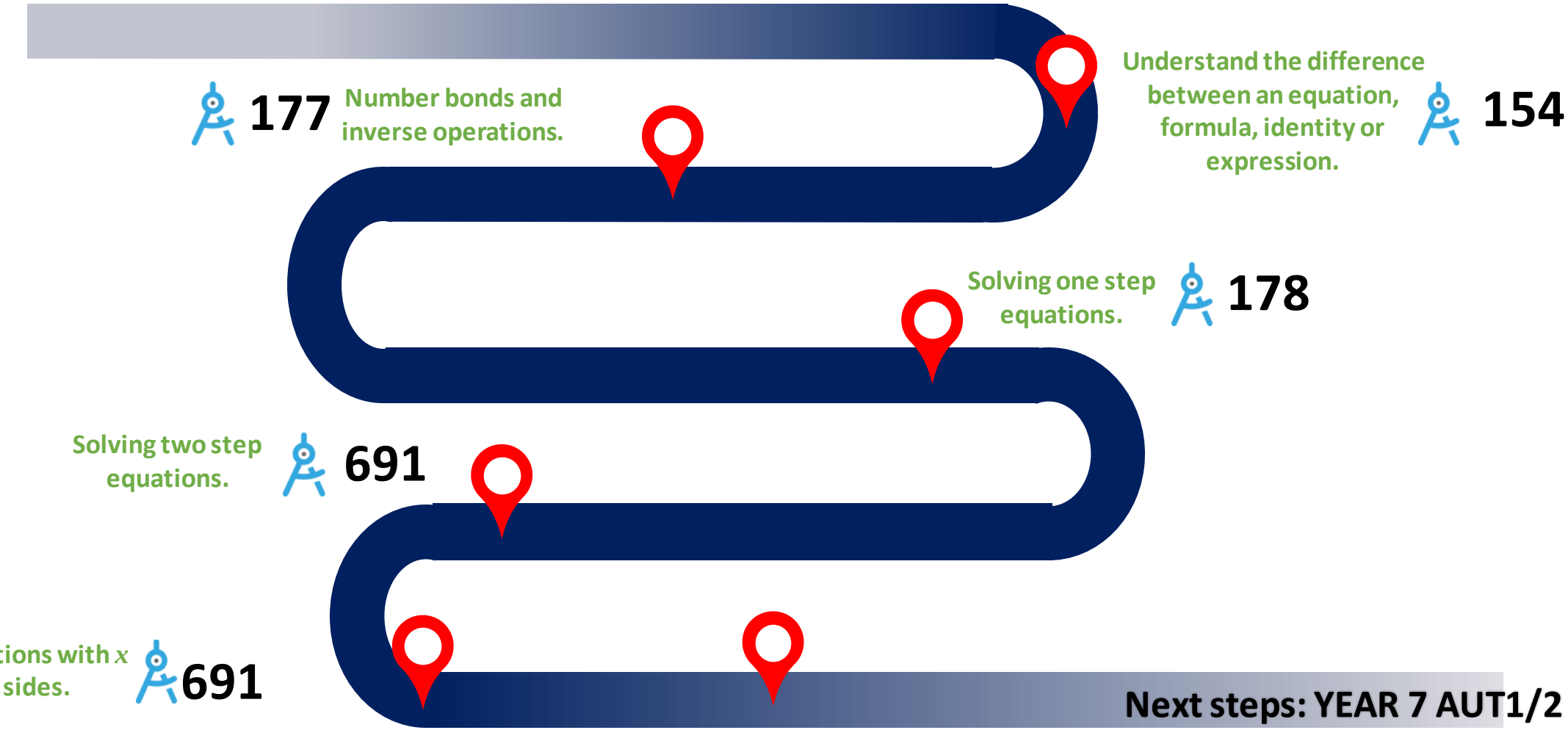
ALGEBRA

Prerequisite learning:

- Expressing missing number problems algebraically (YEAR 6)
- Find pairs of numbers that satisfy an equation with two unknowns (YEAR 6)

YEAR 7 AUTUMN 1
Solving equations



Next steps: YEAR 7 AUT1/2

- Understand sequences.
- Find the nth term of a sequence

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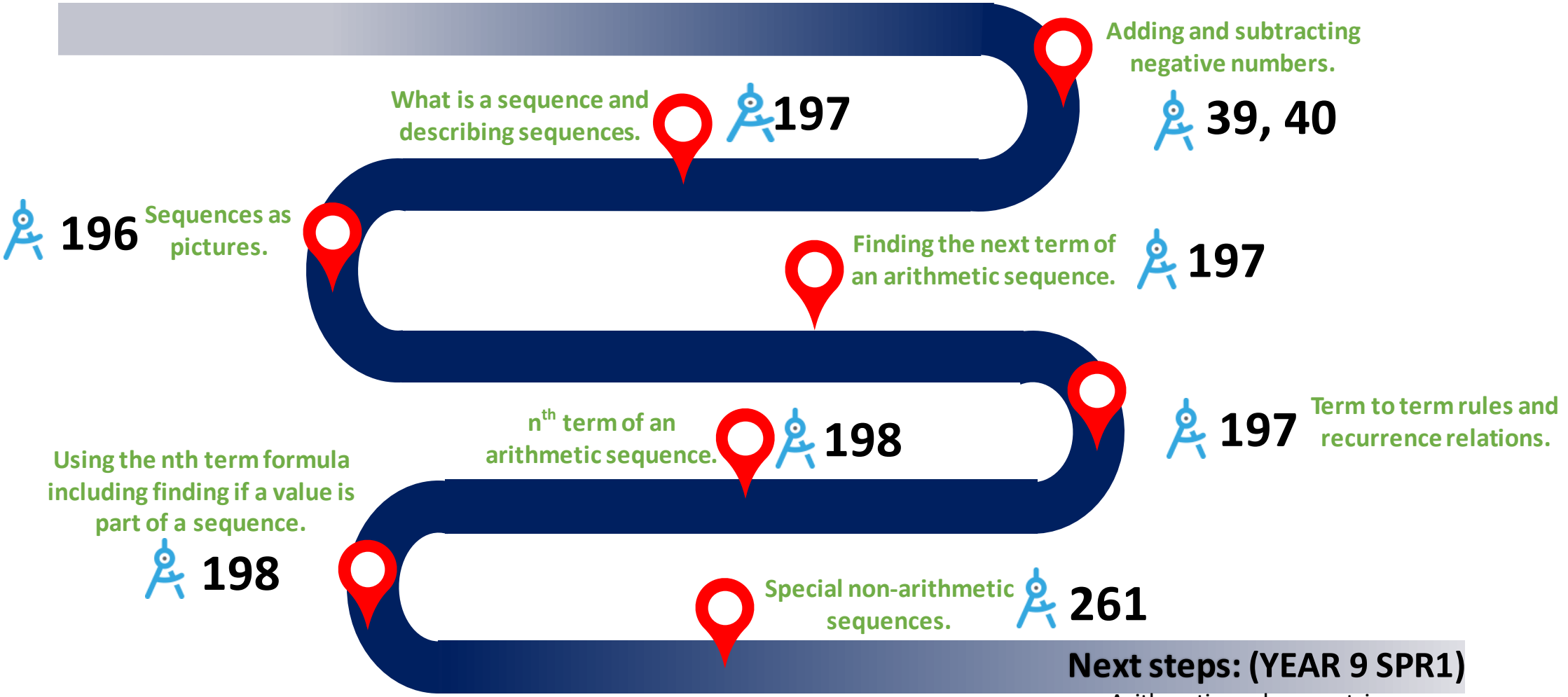
YEAR 7 AUT1/2 Sequences

Prerequisite learning:

- Understanding multiples – (YEAR 5)
- Express missing numbers using letters. (YEAR 6)
- Generate and describe linear number sequences (YEAR 6)



Next steps: (YEAR 9 SPR1)

- Arithmetic and geometric sequences
- Quadratic sequences

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Prerequisite learning:

- Understand that a letter can represent numbers (YEAR 6)
- Be able to express missing number problems algebraically (YEAR 6)
- Understand the meaning of square numbers (YEAR 5)
- Factors, multiples and primes (YEAR 7)

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YEAR 8 AUT1/2 Simplifying and manipulating algebra

Find the perimeter of rectangles.
548-550

Understand the idea of an 'identity' relationship.
154

Know the difference between an equation, formula, identity and expression.
154

Simplify an expression by collecting like terms.
156,157

Expand and simplify expressions involving brackets.
160,161

Factorise simple expressions.
168

Fully factorise more complex expressions.
169

Substitution with brackets and squared terms
783

Next steps: YEAR 9 AUT2

- Expand and simplify two brackets
- Factorise into two brackets.
- Substitute into equations and formulae

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YEAR 8 SPR2 Plotting and interpreting graphs

Prerequisite learning:

- To plot and read coordinates in 4 quadrants (YEAR 6)
- Substitute values into expressions (YEAR 7 AUT1)
- Understand and use the relationship in parallel lines (YEAR 7 SU2).

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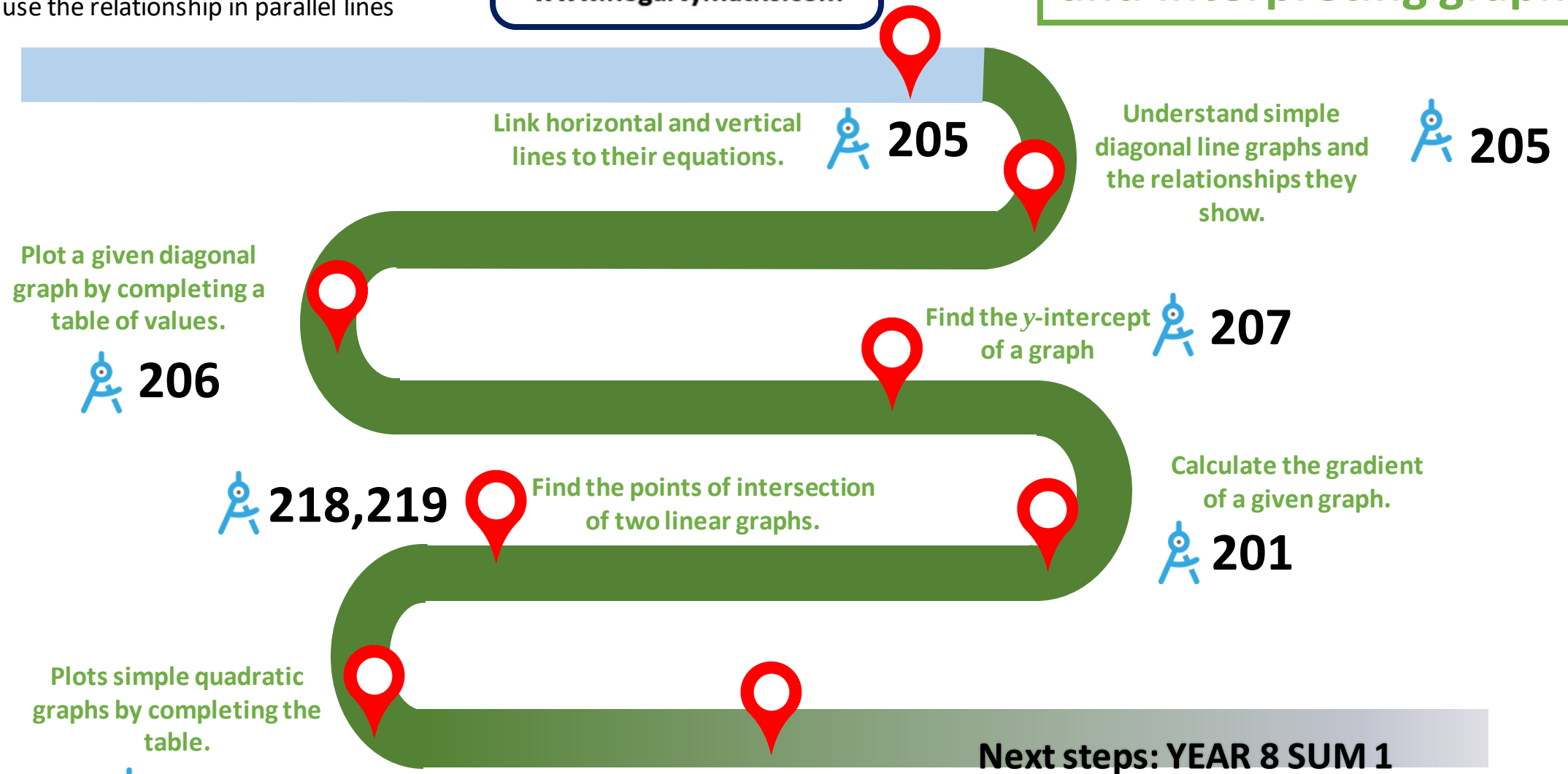

Next steps: YEAR 8 SUM 1

- Sketch linear graphs using gradient and intercept.
- Use and interpret conversion graphs.
- Solve problems with linear graphs in context.

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Prerequisite learning: YEAR 8 SUM1

- How to draw a linear graph with a table.
- Finding the gradient and intercept from a drawn graph.
- Solving linear equations using graphs.

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YEAR 8 SUM 2 Applied graphs

Understand the equation $y = mx + c$ and its straight line graphs. **207-209**

Sketch a linear relationship using y-intercept and gradient. **208**

Use and interpret a conversion graph using gradient. **712,713**

Interpret linear graphs in context with a non-zero intercept. **712,713**

Solve problems with linear graphs in context. **712,713**

Use linear graphs to solve problems with two missing variables. **218,219**

Solve simultaneous linear equations graphically. **218,219**

Next steps: YEAR 9 SPR2/SU1

- Solve quadratic equations graphically.
- Solve graphically simultaneous equations where one is quadratic.

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YEAR 9 SPR1 ALGEBRA BASICS

Prerequisite learning:

- Factors and multiples (YEAR 7 AUT2 NUMBER)
- Order of operations (YEAR 8 SU1 NUMBER)
- Equivalent expressions (YEAR 7 AUT1, YEAR 8 AUT1, YEAR 9 SPR1)
- Inverse operations/function machin[illegible]/YEAR 7 AUT1, SPR1

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Understand algebraic terms and symbols.
151,152

Identify expressions, equations, formulae and identities.
156,157,159

Use index notation and laws.
153

Simplify algebraic expressions by collecting like terms including fractional and surd coefficients.
156-159

Substitution into expressions and formulae.
189,287

Expand and simplify expressions with single, double and triple brackets.
160-166

Factorise into single and double brackets.
168-169

Find the difference of two squares and factorise into double brackets including with a coefficient.
223-228

Solve linear equations.
177-186

Rearrange formulae including the subject on both sides.
287

Linear and quadratic sequences.
198, 247-250

Next steps:

- Set-up and solve equations in context (year 10A and B
- Algebraic proof (year 10B)
- Solving algebraic fractions.(Year 10B)
- Using algebra in context.
- Solving quadratic equations.(Year 10A &B)

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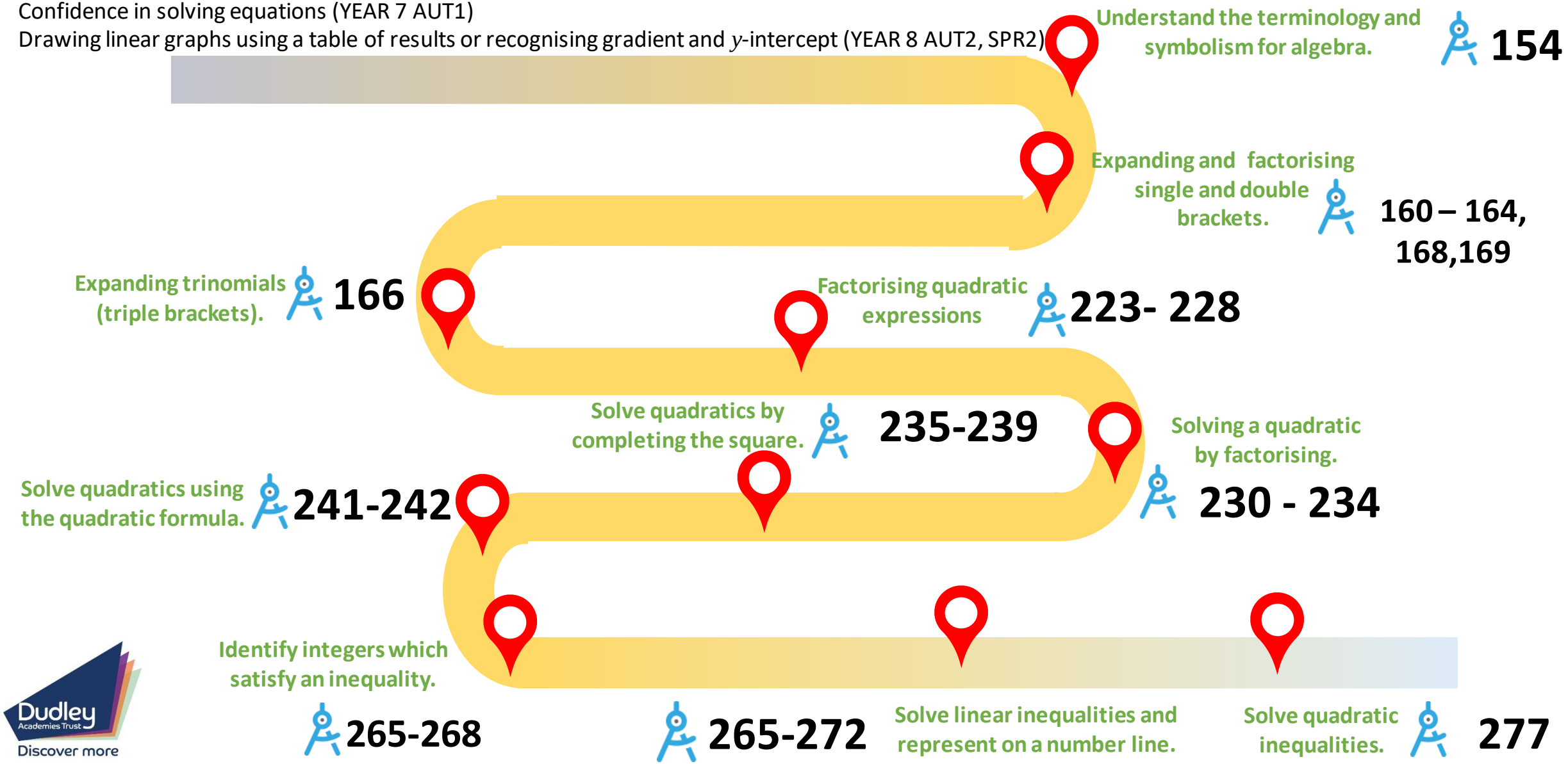
Prerequisite learning:

- Knowing what 'sum' and 'product' means (YEAR 5, YEAR 7 AUT1)
- Powers and roots (Year 8 SPR2 NUMBER)
- Basic algebraic rules for expressions YEAR 7 AUT1, YEAR 8 AUT1, YEAR 9SPR1)
- Confidence in solving equations (YEAR 7 AUT1)
- Drawing linear graphs using a table of results or recognising gradient and *y*-intercept (YEAR 8 AUT2, SPR2)

YEAR 9 SPR2/ SU2 Quadratics1



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YEAR 9 SU2 Quadratics

Plot and draw quadratic graphs. 251

Sketching and understanding key points on a quadratic graph. 252-257

Use quadratic graphs to solve equations. 252-256

Solve simultaneous equations using elimination and substitution. 190-195

Solve simultaneous equations graphically. 259

Sketch graphs of linear, quadratic and cubic functions. 259,299

Use iteration to find approximate solutions to equations. 322

Next steps:

- Using a quadratic graph to find 'root' solutions (YEAR 10 Route A AUT1, Route B SPR1)
- Know how to plot and draw cubic graphs (YEAR 10 Route B AUT1)
- Know how to plot and draw reciprocal graphs (Year 11 Route B)
- Within Further Maths GCSE you will be introduced to polynomial division and within A Level Maths you will solve cubic equations algebraically.

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YEAR 10 ROUTE A

YEAR 10 Route A AUT2 EQUATIONS AND INEQUALITIES

Prerequisite learning:

- Know the inequality symbols (YEAR 2-6, YEAR 7 NUMBER)
- Rounding to a given degree of accuracy (YEAR 7 AUT1 NUMBER)
- Order of operations (YEAR 6, YEAR 8 SU1, YEAR 9 AUT2 NUMBER)
- Understand the expression/formulae/ equation/ identity (YEAR 7 AUT1, YEAR 8 AUT 1, YEAR 9 SPR1)
- Using function machines (YEAR 7 AUT2/SPR1)
- Find next term in the sequence (YEAR 7 AUT2/ SPR 1)

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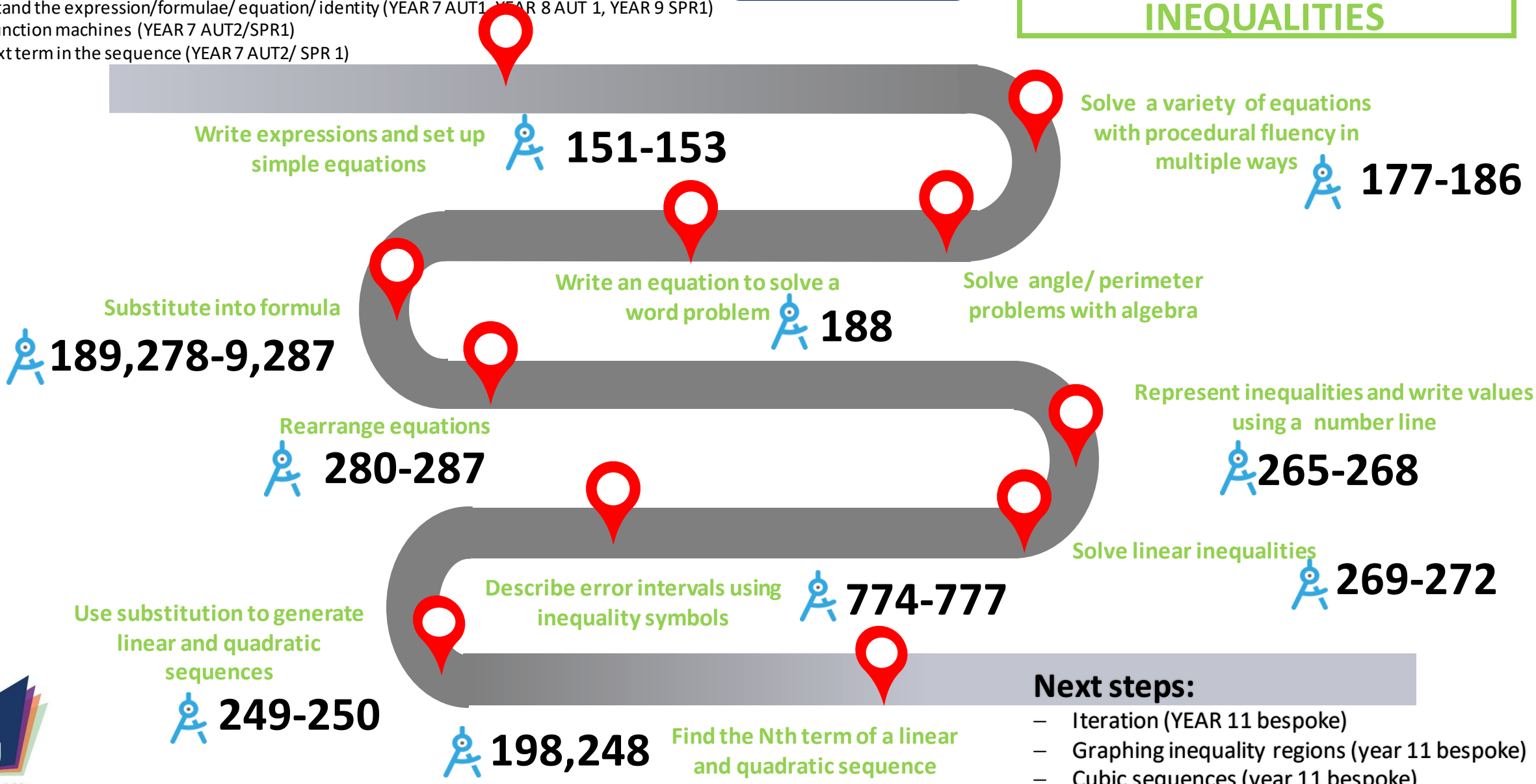

Next steps:

- Iteration (YEAR 11 bespoke)
- Graphing inequality regions (year 11 bespoke)
- Cubic sequences (year 11 bespoke)

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YEAR 10 Route A SPR2 QUADRATICS

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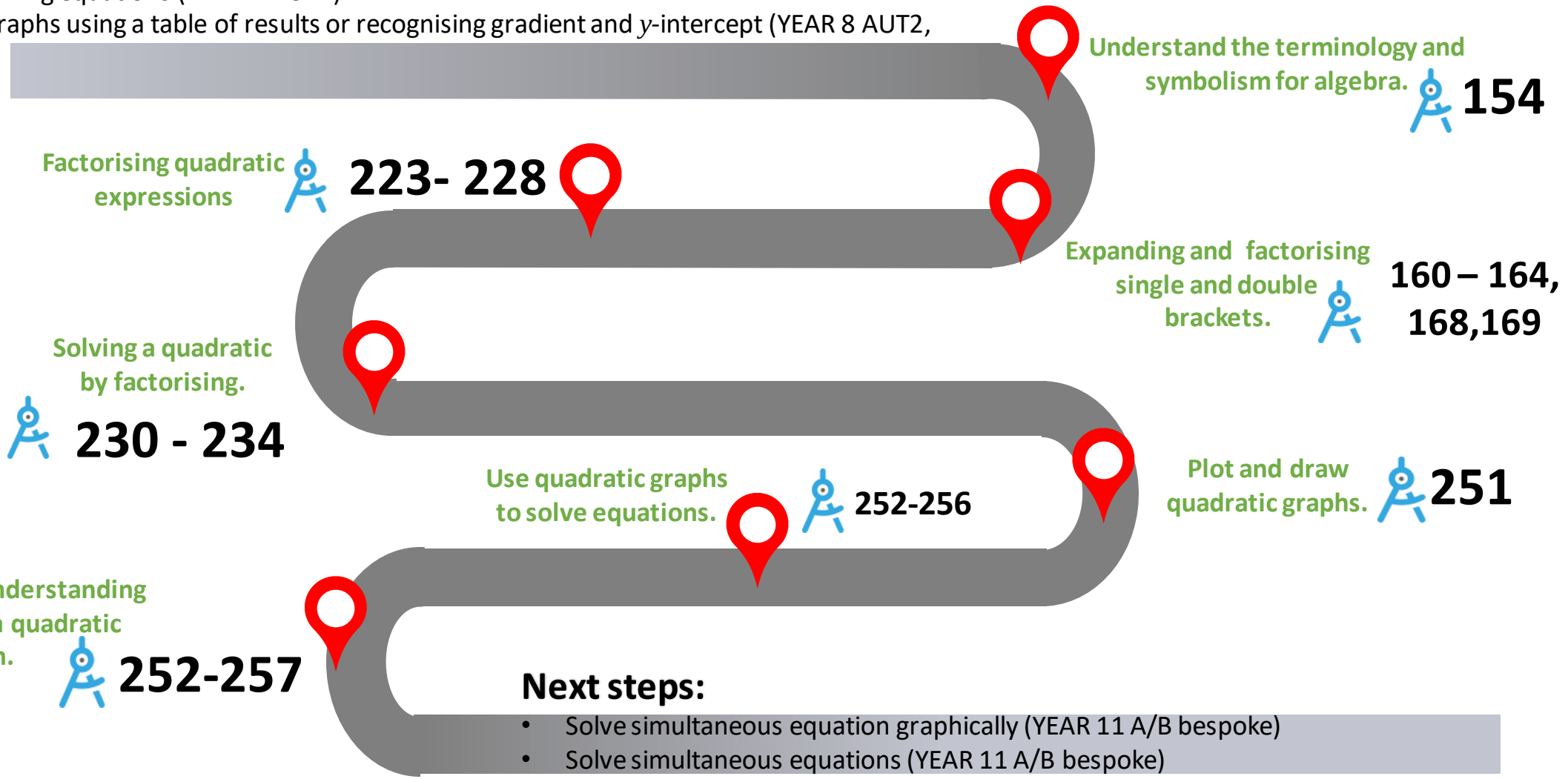
Prerequisite learning:

- Knowing what 'sum' and 'product' means (YEAR 5, YEAR 7 AUT1)
- Powers and roots (Year 8 SPR2 NUMBER)
- Basic algebraic rules for expressions YEAR 7 AUT1, YEAR 8 AUT1, YEAR 9SPR1)
- Confidence in solving equations (YEAR 7 AUT1)
- Drawing linear graphs using a table of results or recognising gradient and y-intercept (YEAR 8 AUT2, SPR2)



Next steps:

- Solve simultaneous equation graphically (YEAR 11 A/B bespoke)
- Solve simultaneous equations (YEAR 11 A/B bespoke)
- Cubic and reciprocal graphs (YEAR 11 ROUTE A bespoke)
- Within Further Maths GCSE you will be introduced to polynomial division and within A Level Maths you will solve cubic equations algebraically.

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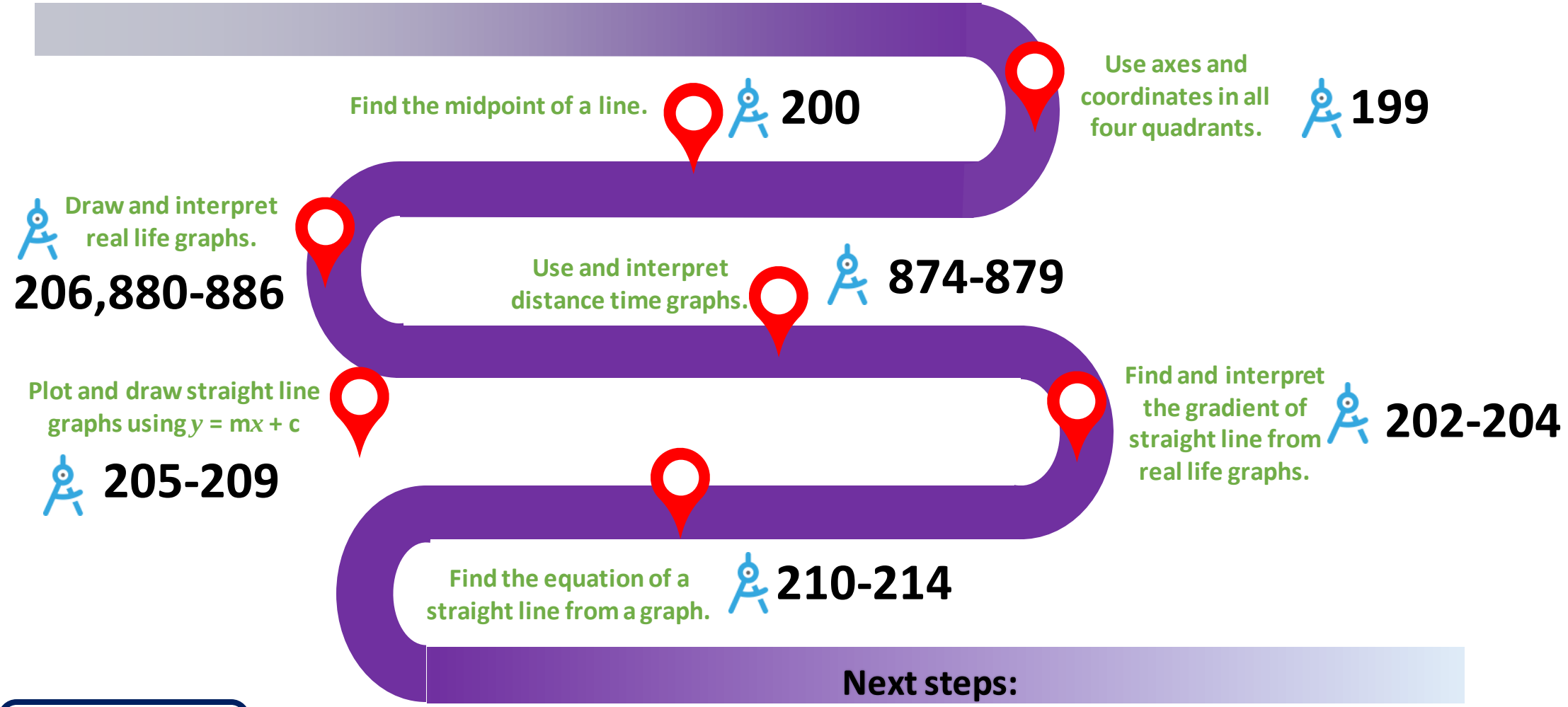
YEAR 11 ROUTE A

Prerequisite learning:

- Plotting, Reading and drawing scales, coordinates (YEAR 6, YEAR 8 AUT2, SPR 2)
- Algebraic substitution (YEAR 7 AUT1, YEAR 8 AUT 1/2, YEAR 9 SPR 1)

YEAR 11 Real life and straight line graphs



Next steps:

- Drawing non-linear graphs (YEAR 11 Route A)
- Creating the links between algebraic and graphical solutions to equations. (YEAR 11 Route A)

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YEAR 10 ROUTE B

Prerequisite learning:

- solving equations (YEAR 7 AUT1, YEAR 8 AUT1, YEAR9 SPR1/SU1)
- Drawing linear graphs using a table of results or recognising gradient and y-intercept (YEAR 8 AUT2, YEAR 9 SPR2/SU1)

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YEAR 10 Route B AUT1
EQUATIONS AND INEQUALITIES

Next steps:

- Within Further Maths GCSE you will be introduced to polynomial division and within A Level Maths you will solve cubic equations algebraically.

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YEAR 10 SU 2 Quadratics, simultaneous equations, inequalities and iteration

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Prerequisite learning:

- Solving linear equations (YEAR 7 AUT1,
- Factorising into a single bracket (YEAR 8 AUT1, YEAR 9 SPR1).
- Substitution into equations (YEAR 8 AUT1/ SPR1, YEAR9 SPR1)
- Rearranging simple equations (YEAR 9 SPR1).

Factorising quadratic equations in the form $ax^2 + bx + c$ 223-228

Solve quadratics using the quadratic formula. 241-242

Solve quadratics by completing the square. 235-239

265-268 Identify integers which satisfy an inequality.

Solve simultaneous equations using elimination and substitution. 190-195

Solve linear inequalities and represent on a number line. 265-272

246 Solve simultaneous equations when one is a quadratic.

Use iteration to find approximate solutions to equations. 322

Solve $x^2 + y^2 = r^2$ 314-317

Next steps:

- Solve simultaneous equations when one of the given equations is a circle and the other is a linear equation. (YEAR 11 bespoke)
- Shading regions using inequalities. (YEAR 11 bespoke)
- Solve quadratics within geometry problems (YEAR 11 bespoke)

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YEAR 11 ROUTE B

Prerequisite learning:

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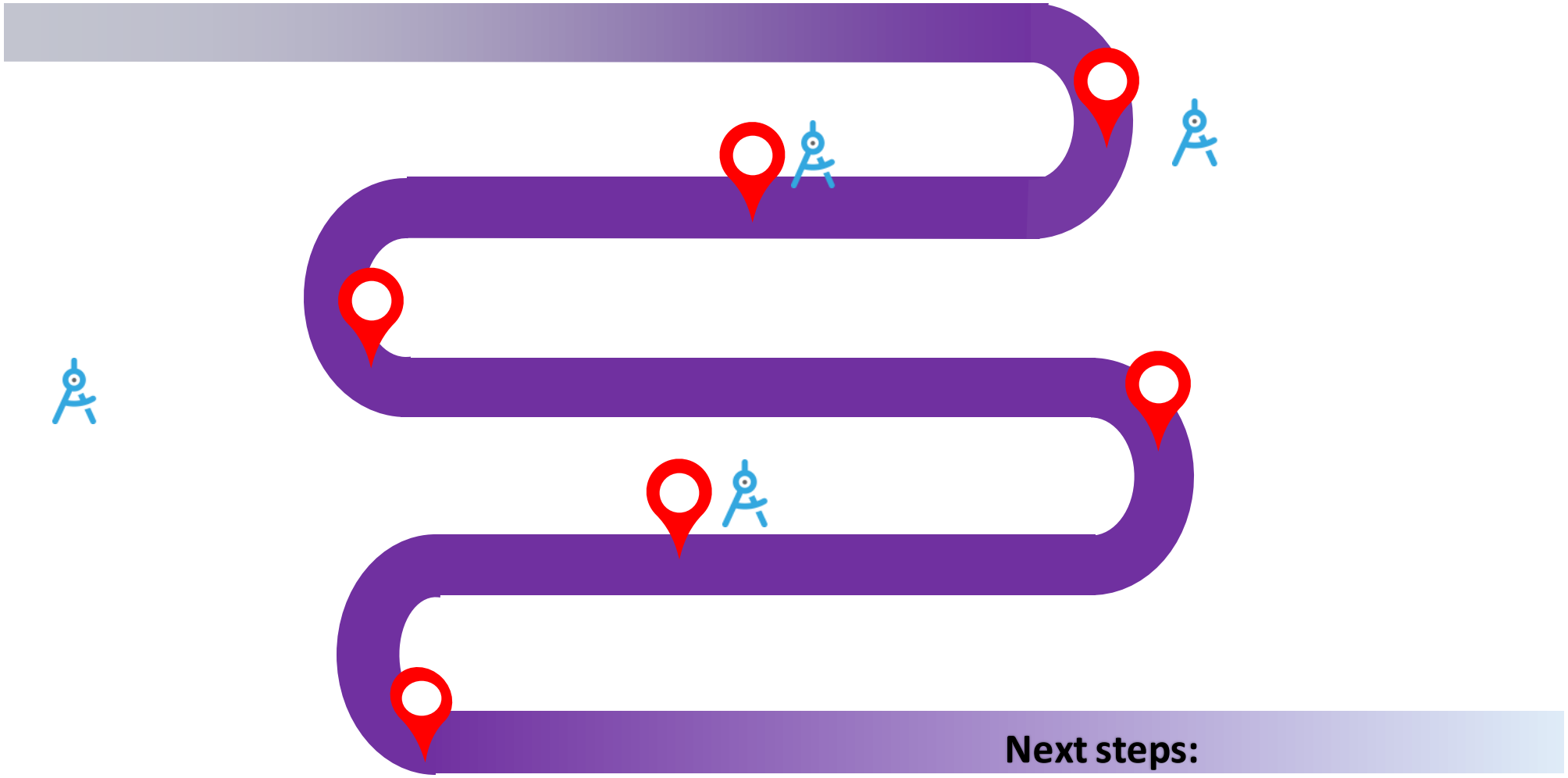
Year 11 Route B Rates of change and Graphs



Next steps:

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