

Meridian Maths Curriculum Year 10

Crossover Pathway

Autumn Term

Surds

Linear Simultaneous Equations

Rounding

Limits of Accuracy

Charts and Graphs 2

Arcs and Sectors

Linear Inequalities

Expand and factorise single

brackets

Factorising quadratics

Spring Term

Further volume and surface area

Similarity and trigonometry

Basic probability

Advanced probability 2

Solving quadratics

Linear graphs

Linear graphs 3

Summer Term

Index Laws

Further Index Laws

Ratio

Harder ratio

Proportion

Algebraic proportion

Linear sequences

Quadratic sequences

Transformations

Vectors

Surds

- Estimate roots of any given positive number
- What is a surd?
- Arithmetic with surds
- Simplifying a surd
- Problem solving with Pythagoras
- Rationalise the denominator
- Expanding brackets with surds

Sparx Maths

Independent Learning Codes

Skill	Code

Linear Simultaneous Equations

- Solve simple worded problems
- Solve simultaneous equations where equations can be subtracted
- Solve simultaneous equations where one equation needs to be transformed
- Solve simultaneous equations where two equations need to be transformed
- Solve linear simultaneous equations graphically
- Derive simultaneous equations and interpret solutions

Sparx Maths

Independent Learning Codes

Skill	Code

Rounding

- Rounding to the nearest 10, 100, 1000
- Rounding to significant figures
- Estimation
- Rounding to a given number of decimal places
- Use of inequality symbols

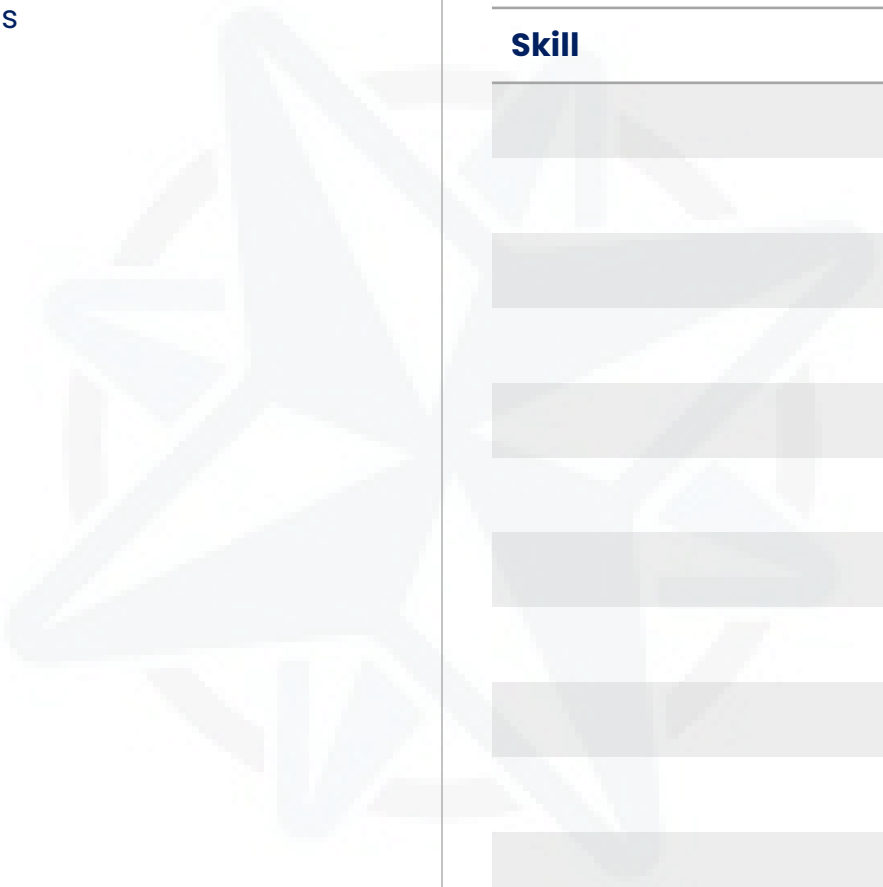
Sparx Maths

Independent Learning Codes

Skill	Code
Rounding integers	M111
Rounding decimals	M431
Rounding integers using significant figures	M994
Rounding decimals using significant figures	M131
Estimating calculations	M878

Limits of Accuracy

- Truncation Limits of accuracy
- Upper and lower bounds (linked to intervals) including finding upper and lower bounds in calculations
- Problem solving involving bounds



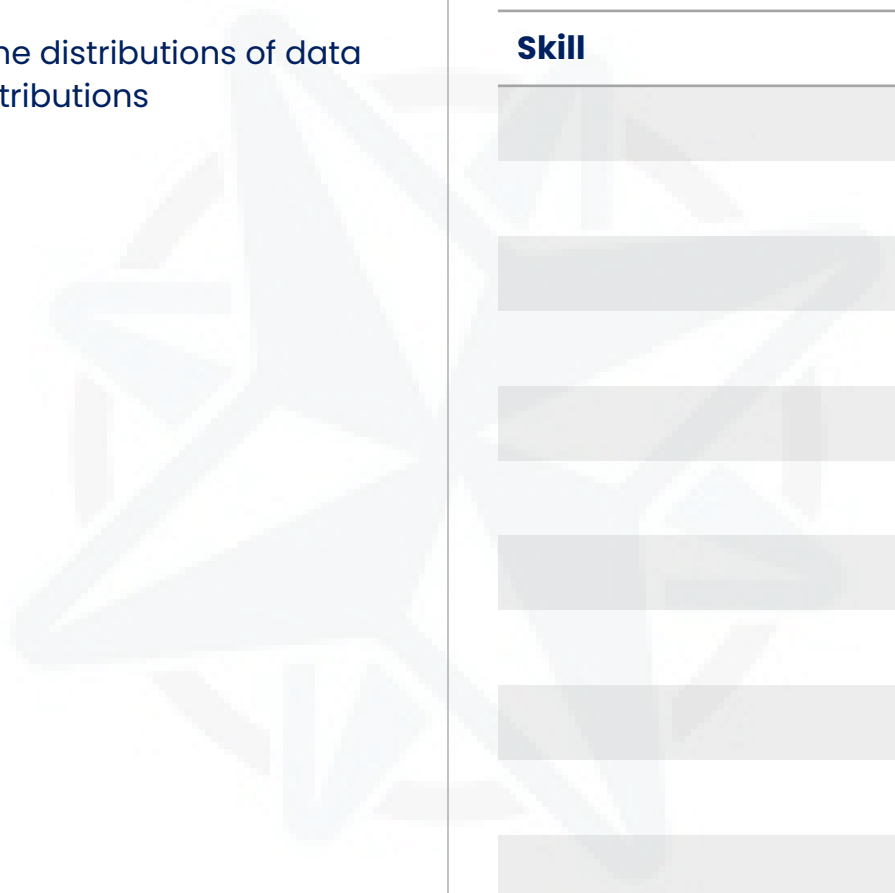
Sparx Maths

Independent Learning Codes

Skill	Code

Charts and Graphs 2

- Histograms with equal and unequal class intervals
- Problem solving with histograms
- Cumulative frequency graphs, and know their appropriate use
- Interpret, analyse and compare the distributions of data sets from univariate empirical distributions



Sparx Maths

Independent Learning Codes

Skill	Code

Arcs and Sectors

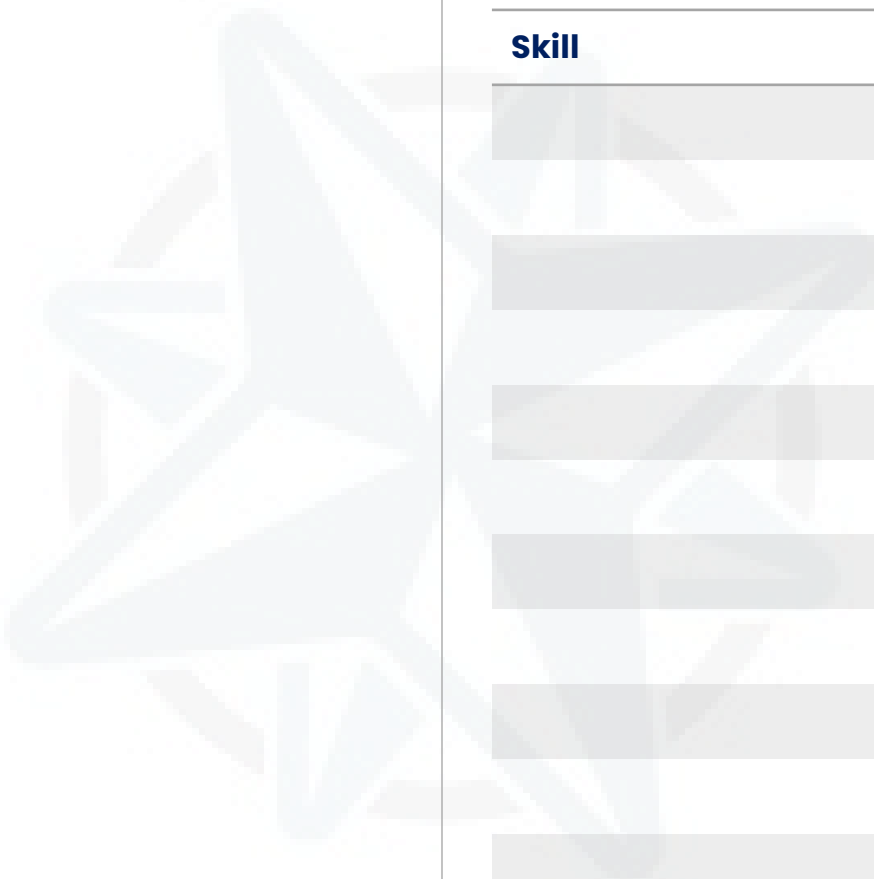
- Calculating with multiples of π
- Finding areas of sectors using any angle
- Finding arc lengths and angles using any angle and finding the perimeter of sectors

Sparx Maths

Independent Learning Codes

Skill	Code

- Introduction to inequalities
- Solve linear inequalities in one or two variable(s)
- Solve linear inequalities and represent the solution set on a number line



Sparx Maths

Independent Learning Codes

Skill	Code

Expand and Factorise Single Brackets

- Finding factors and multiples
- Expand single brackets
- Factorise into a single bracket

Sparx Maths

Independent Learning Codes

Skill	Code
Odd and even numbers	M777
Multiples	M752
Finding factors and using divisibility tests	M823
Finding the lowest common multiple (LCM)	M227
Finding the highest common factor (HCF)	M698
Expanding single brackets	U179
Expanding double brackets	U768

Factorising Quadratics

- Expand triple brackets
- Factorise monic quadratic expressions
- Difference of two squares
- Factorising non-monic quadratic expressions

Sparx Maths

Independent Learning Codes

Skill	Code

Further Volume and Surface Area

- Similarity with length, area and volume
- Change freely between related standard units in numerical and algebraic contexts eg
 - time
 - length,
 - area,
 - volume
 - capacity
 - Mass
- Know the formulae:
 - surface area and volume of spheres, pyramids, cones and composite solids
- Apply the concepts of congruence and similarity, including the relationships between lengths, areas and volumes in similar figures
- Including calculations in terms of pi
- Density and Pressure Applications.

Sparx Maths

Independent Learning Codes

Skill	Code

Similarity and Trigonometry

- Understand that the trigonometric functions are derived from measurements within a unit circle
- Recognise the right-angled triangle within a unit circle and use proportion to scale to similar triangles
- Know how the sine, cosine and tangent ratios are derived from the sides of a right-angled triangle
- Choose appropriate trigonometric relationships to use to solve problems in right-angled triangles
- Use trigonometric ratios to find a missing side in a right-angled triangle
- Use trigonometric ratios to find a missing angle in a right-angled triangle
- Use trigonometric ratios to find a missing angle or side in a right-angled triangle
- Solving complex problems

Sparx Maths

Independent Learning Codes

Skill	Code

Basic Probability

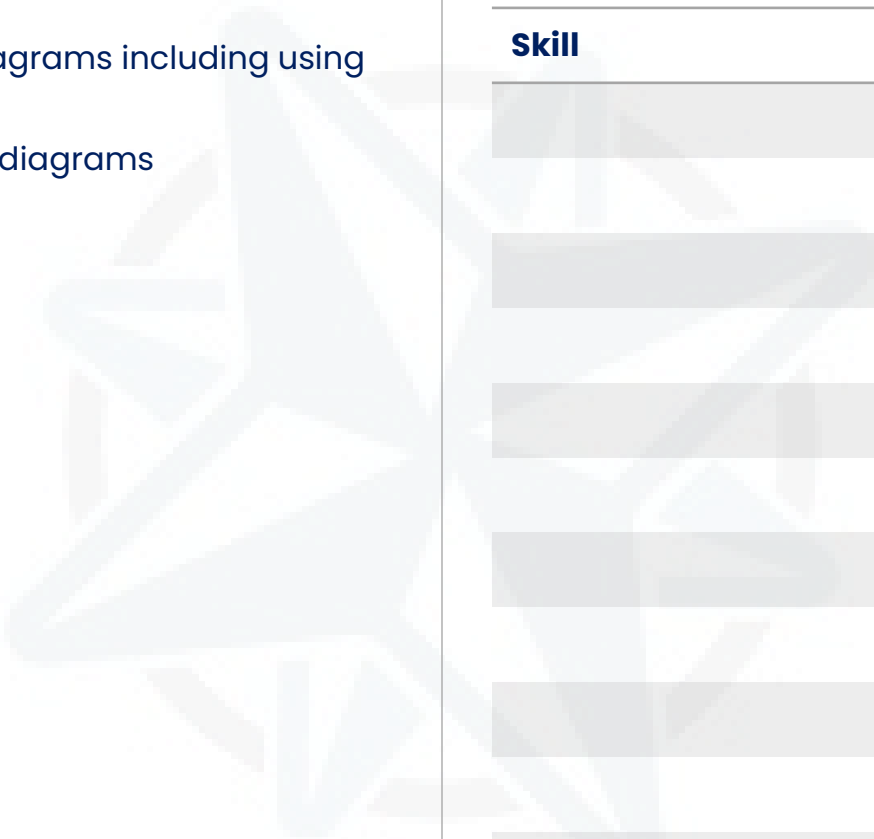
- The probability scale
- Single event probability
- Mutually exclusive and exhaustive events
- Sample space diagrams

Sparx Maths

Independent Learning Codes

Skill	Code
Using probability phrases	U803
Writing probabilities as fractions	U408
Writing probabilities as fractions, decimals and percentages	U510
Probabilities of mutually exclusive events	U683
Expected results from repeated experiments	U166
Sample space diagrams	U104
Systematic listing	U714

- Use Venn diagrams to display information and use this to calculate probabilities.
- Recap set notation and link to the regions of the Venn diagram
- Complete more complex Venn diagrams including using fdp and ratio.
- Conditional probability with Venn diagrams



Sparx Maths

Independent Learning Codes

Skill	Code

Retrieval

- Recap factorising where $a=1$ and $a>1$
- Recap completing the square where $a=1$ and $a>1$

New Content

- Solve quadratic equations (including those that require rearrangement) algebraically by factorising. Link to the graph
- Solve quadratic equations (including those that require rearrangement) algebraically by completing the square and deduce the coordinates of the turning point
- Solve quadratic equations (including those that require rearrangement) algebraically by using the quadratic formula

Further Maths

- Equate coefficients to obtain unknown values
- Solve quadratic equations by graph including adding additional lines.
- Identify the maximum or minimum point of a quadratic graph including $a>1$ identify symmetries on a quadratic graph

Sparx Maths	
Independent Learning Codes	
Skill	Code

- Plotting coordinates
- Calculating the gradient
- Finding the intercept
- Horizontal and vertical lines
- $y=mx+c$
- Plotting graphs

Sparx Maths

Independent Learning Codes

Skill	Code
Reading and plotting coordinates	U789
Calculating midpoints	U933
Solving shape problems involving coordinates	U889
Plotting straight line graphs	U741
Finding equations of straight line graphs	U315
Interpreting equations of straight line graphs	U669

- Find the equation of the line through two given points, or through one point with a given gradient
- Unconventional representations of lines to be included at each stage to ensure familiarity. Graphs to be implicit and explicit
- Real life linear graphs
- Use the form $y = mx + c$ to identify parallel and perpendicular lines and find their equations
- Coordinate Geometry problems

Further Maths

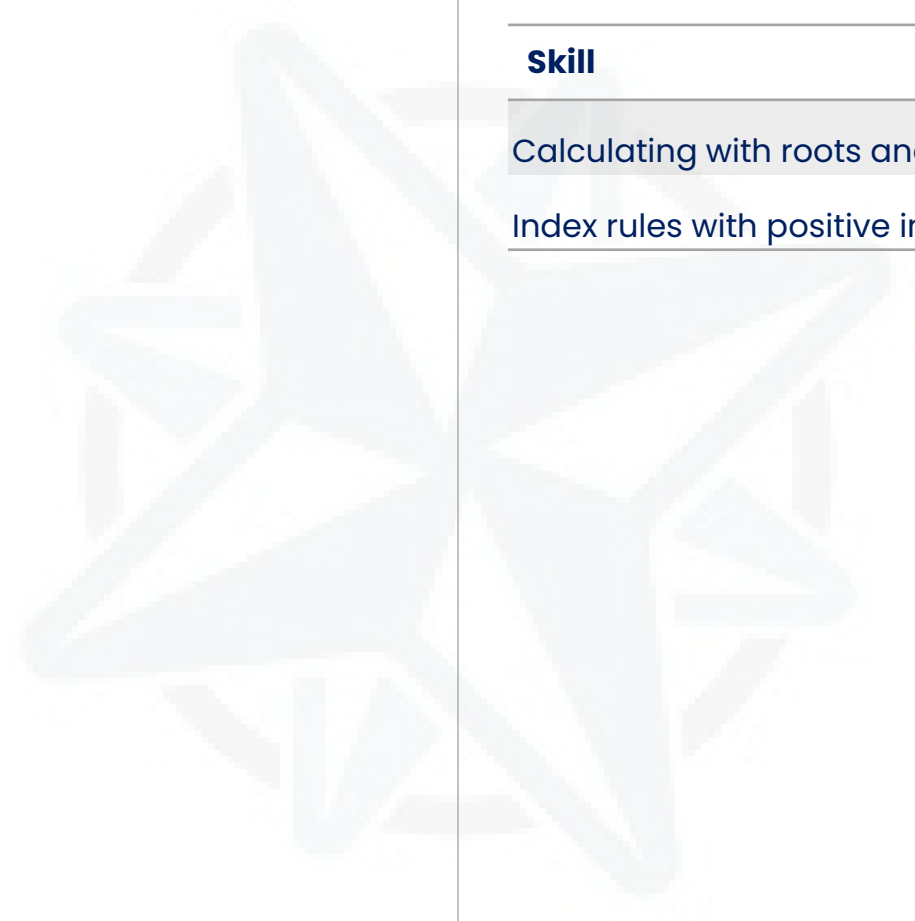
- Use the equation of a straight line in the form $y - y_1 = m(x - x_1)$

Sparx Maths

Independent Learning Codes

Skill	Code

- Square and cube numbers
- First three index laws (multiplying, dividing and powers of powers)
- Combining first three index laws



Sparx Maths

Independent Learning Codes

Skill	Code
Calculating with roots and powers	M135
Index rules with positive indices	U235

Further Indices

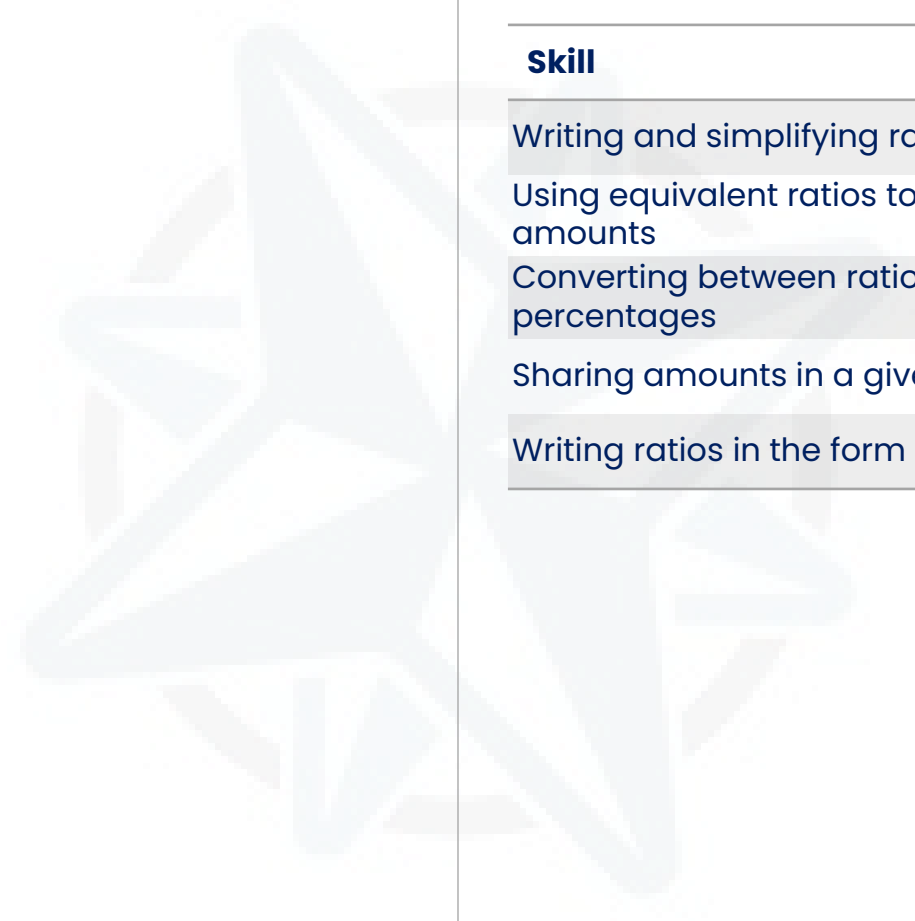
- Changing bases
- Negative indices
- Fractional indices (unit fractions)

Sparx Maths

Independent Learning Codes

Skill	Code

- Simplifying ratio
- Unitary ratio
- Sharing in a ratio



Sparx Maths

Independent Learning Codes

Skill	Code
Writing and simplifying ratios	M885
Using equivalent ratios to find unknown amounts	M801
Converting between ratios, fractions and percentages	M267
Sharing amounts in a given ratio	M525
Writing ratios in the form 1:n or n:1	M543

Harder Ratio

- Combining and comparing ratio
- Solving ratio problems
- Ratio problems including converting fractions to ratio

Sparx Maths

Independent Learning Codes

Skill	Code
Converting between ratios, fractions and percentages	U176
Sharing amounts in a given ratio	U577
Combining ratios	U921

Proportion

- Recipes
- Best value
- Direct proportion
- Inverse proportion

Sparx Maths

Independent Learning Codes

Skill	Code
Solving direct proportion word problems	U721
Solving inverse proportion word problems	U357
Currency conversion	U610

Algebraic Proportion

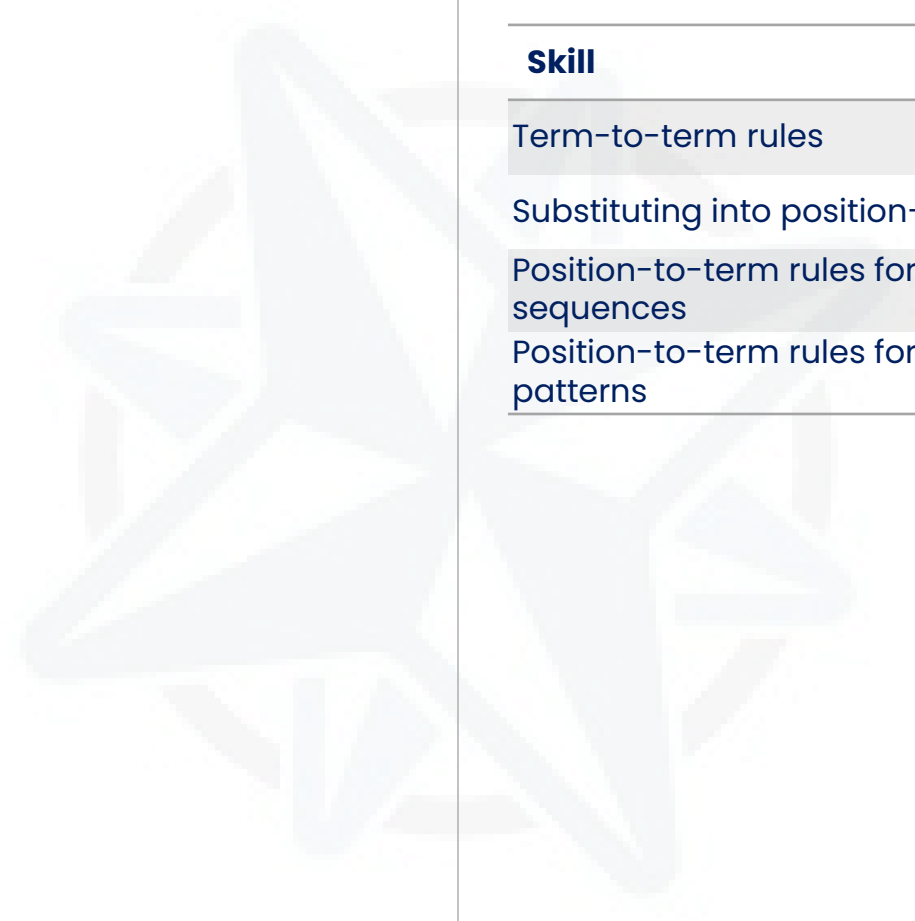
- Solve direct proportion word problems, link to linear graph
- Introduce constant of proportionality and set up direct proportion equations
- Set up and solve direct proportion equations when directly proportional to other functions ie x^2
- Solve inverse proportion problems, link to graph
- Set up and solve inverse proportion equation when inversely proportional to x
- Set up and solve inverse proportion equations when inversely proportional to other functions ie x^2

Sparx Maths

Independent Learning Codes

Skill	Code

- Linear nth term
- Generating linear sequences from the nth term
- Plotting linear sequences
- Is this number in the sequence?



Sparx Maths

Independent Learning Codes

Skill	Code
Term-to-term rules	U213
Substituting into position-to-term rules	U530
Position-to-term rules for arithmetic sequences	U498
Position-to-term rules for sequences of patterns	U978

Quadratic Sequences

- Deduce expressions to calculate the nth term of quadratic sequences. n^2 and n^2+c
- Geometric progression – describe
- Identify different types of sequence and continue all

Sparx Maths

Independent Learning Codes

Skill	Code

Transformations

- Congruent transformations
 - Translation
 - Reflection
 - Rotation
- Combined transformations
- Describe translations as 2D vectors

Sparx Maths

Independent Learning Codes

Skill	Code
Translation	U196
Reflection	U799
Rotation	U696
Combining transformations	U766

- Describe translations as 2D vectors
- Vector arithmetic – add and subtract and multiply by a scalar. Link addition to triangle law of vectors
- Solve problems involving vectors – including dividing a line in a ratio

Sparx Maths

Independent Learning Codes

Skill	Code