

Meridian Maths Curriculum

Year 10

Higher Tier Pathway

Autumn Term

Surds

Linear Simultaneous Equations

Limits of Accuracy

Charts and Graphs 2

Arcs and Sectors

Linear Inequalities

Factorising Quadratics and

Completing the Square

Spring Term

Further Volume and Surface

Area

Similarity and Trigonometry

Advanced Probability 2

Solving Quadratics

Linear Graphs 3

Summer Term

Further Indices

Harder Ratio

Algebraic Proportion

Quadratic Sequences

Vectors

Click the topic in the overview above to take you directly to the page for that topic.

Red: Retrieval Topics. Purple: Further Maths Topics.

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

Further Maths Content

- Rationalise the denominator when of the form $a \pm \sqrt{b}$

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

Further Maths

Solving systems of equations

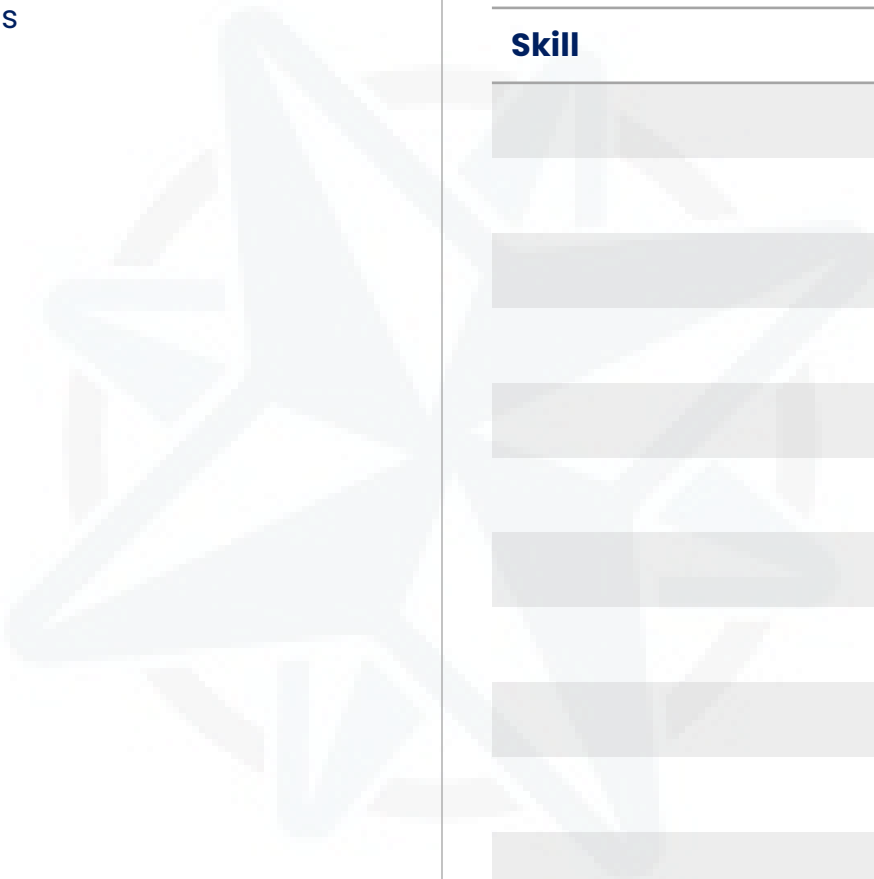
Sparx Maths

Independent Learning Codes

Skill	Code

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



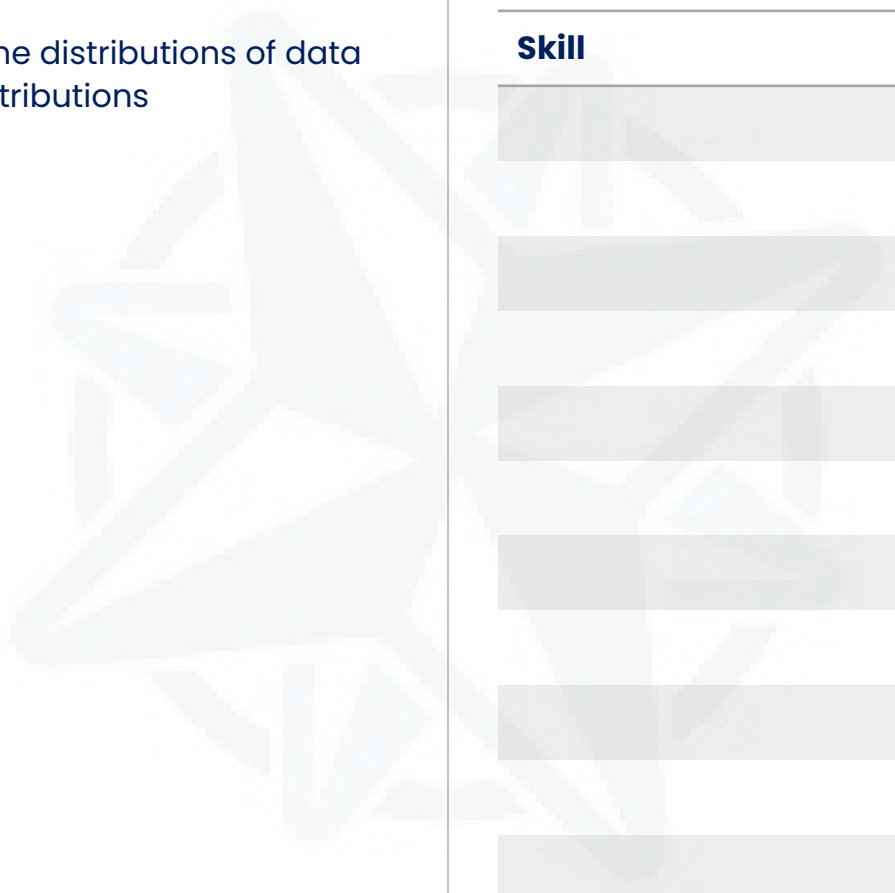
Sparx Maths

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

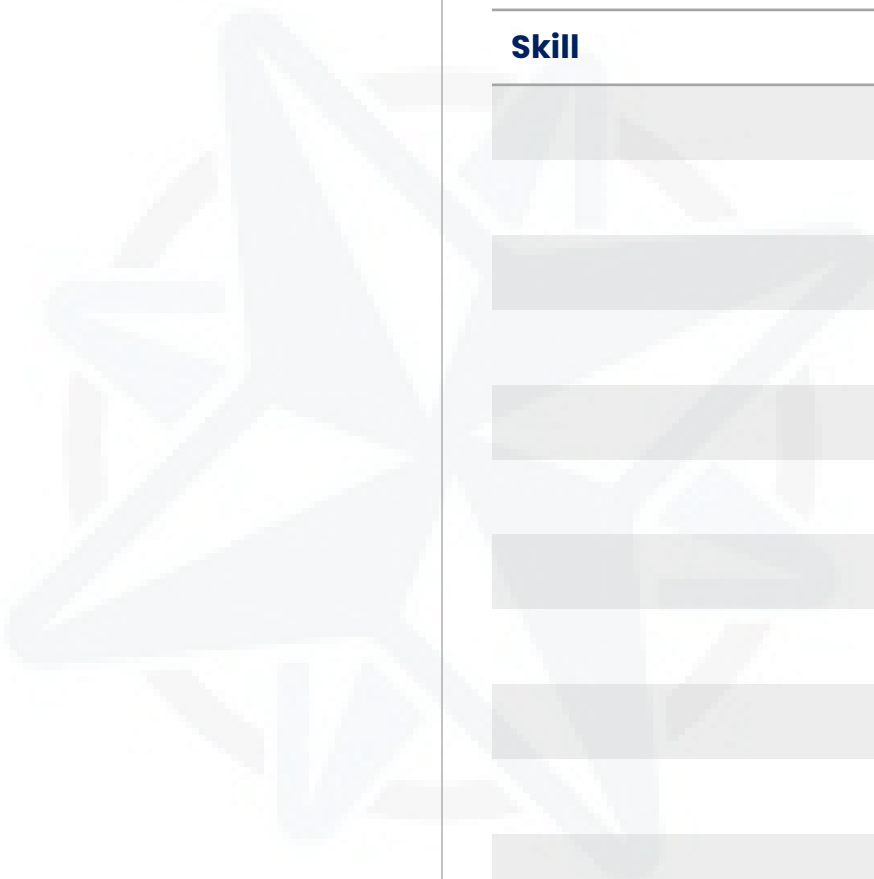
- Calculating with multiples of π
- Finding areas of sectors using any angle
- Finding arc lengths and angles using any angle and finding the perimeter of sectors

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

Factorising Quadratics and Completing the Square

- Expand triple brackets
- Factorise monic quadratic expressions
- Difference of two squares
- Factorising non-monic quadratic expressions
- Completing the square ($a=1$)

Further Maths

- Complete the square ($a>1$)
- Binomial expansion and factor theorem

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

- 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

- 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

Further Indices

- Negative indices
- Fractional indices (unit fractions)
- Fractional indices (proper/improper)
- Fractional and negatives
- Changing bases
- Combine surd and indices knowledge. E.g. write $2\sqrt{2}$ in the form 2^n .

Sparx Maths

Independent Learning Codes

Skill	Code

Harder Ratio

- Combining and comparing ratio
- Solving ratio problems
- Ratio change (subtract– add, exchange)
- Reverse ratio
 - Including with fractions to ratio questions
- Algebra and ratio.

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Independent Learning Codes

Skill	Code

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

Quadratic Sequences

- Deduce expressions to calculate the n th term of quadratic sequences. n^2 and n^2+c and $n^2+linear$
- Geometric progression – describe
- Plotting sequences – linear, quadratic and others
- Fibonacci with algebra
- Solve does this term belong in the sequence problems – link to quadratics and geometric

Further Maths

- work out the limiting value for a given sequence or for a given n th term as n approaches infinity.

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Independent Learning Codes

Skill	Code

Vectors

- 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
- Geometric proof including proof 3 points lie on a straight line

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Independent Learning Codes

Skill	Code