TUXFORD ACADEMY

KS3 & KS4 FOUNDATION TIER MATHS LEARNING JOURNEY

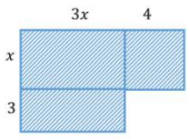
AQA 8300
(All 1 hr 30mins)
PAPER 1 (33%): Non-Calc
PAPER 2 (33%): Calculator
PAPER 3 (33%): Calculator

Integrate Knowledge Into Larger Concepts

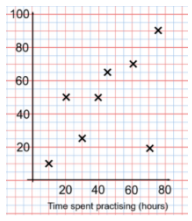
YEAR 11

Types of Graph:
- Plot and interpret…
- Cubic
- Reciprocal
- Graph transformations

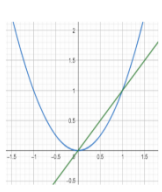
Rate of change

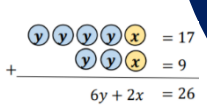


Quadratics:
- Recap all quadratics so far
- Complete the square and understand graphically
- Solve problems in context
- Quadratic Inequalities [H]

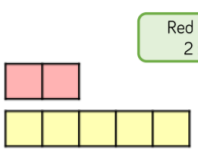


Statistics:
- Frequency polygons
- Scatter graphs
- Time series



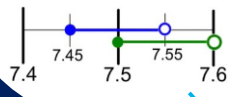


Simultaneous Equations:
- Solve graphically, linearly and with one quadratic.
- Solve problems including fractions negatives and decimals

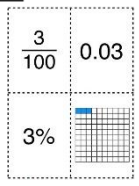


Ratio:
- Understand as a fraction
- Simplify
- Combine
- Divide into a ratio
- Solve complex ratio problems

Error Intervals and Bounds

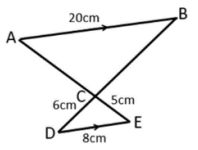


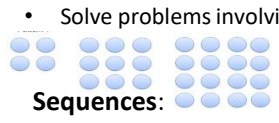
FDP recap



Volume and Surface Area:
- Sphere
- Cone
- Pyramid
- Frustum

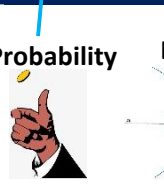
Similar Shapes:
- Find scale factors and missing lengths
- Solve problems involving length, area and volume



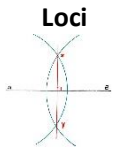


Sequences:
- Find scale factors and missing lengths
- Solve problems involving length, area and volume

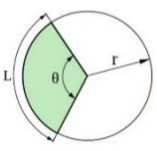
Probability



Loci



Sectors

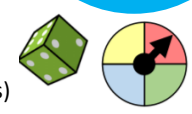


Vectors

$\begin{pmatrix} -3 \\ 2 \end{pmatrix}$

Trigonometry & Pythag:
- Sine rule, cosine rule and area of a triangle

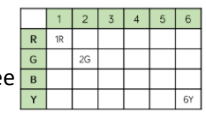
Compound interest, growth and decay.



Pythagoras and Trigonometry:
- Apply Pythagoras's theorem to find missing lengths
- Apply trigonometric ratios to find missing lengths and angles
- Solve problems with the above including angle rules & area.
- All the above in 3D
- Trigonometric graphs
- Exact trigonometric values

$\sin 90 =$ $\tan 45°$

Probability:
- Record and analyse frequency of outcomes using tables and frequency trees (probability as fractions, decimals & percentages)
- Basic rules of probability including all probability sums to 1 and probability on a number line.
- Sample spaces and Venn diagrams including notation
- Mutually exclusive and conditional probability including tree diagrams
- Product rule for counting



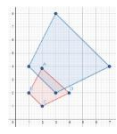
YEAR 10

Quadratics:
- Draw quadratic graphs and find approximate solutions
- Factorise and solve quadratics
- Difference of two squares
- Sketch linear and quadratic functions
- Solve quadratics using the quadratic formula
- Simplify and manipulate expressions involving algebraic fractions

$x^2 + 4x - 5 > 0$

$x^2 + 3x + 2 \equiv (x + 1)(x + 2)$

Transformations:
- Reflection, rotation, translation, enlargement (including fractional and negative scale factors)



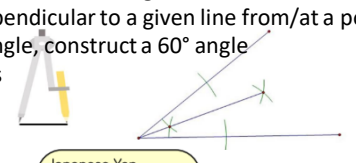
Direct and Inverse Proportion:
- Recap ratio and proportion so far.
- Understand in a real life context
- Form and solve equations
- Understand graphically
- Solve challenging problems

$h \propto \frac{1}{t}$

Ratio & proportion – recap:
- Understand the relationship between ratio and fractions
- Combining ratios to find a:b:c given a:b and b:c
- Given information about one part, find the whole, other part(s) or difference.

Surds and Indices [H]:
- Recap indices so far
- Apply to negative and fractional indices
- Solve equations using indices
- Simplify surds
- Calculate exactly with surds
- Rationalise the denominator
- All of the above with algebra

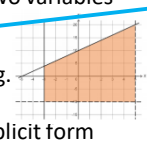
Loci and Construction:
- Perpendicular bisector of a line segment
- Constructing a perpendicular to a given line from/at a point
- Bisecting a given angle, construct a 60° angle
- Solve loci problems



Congruence:
- Use and apply basic congruence criteria for triangles (SSS,SAS,AS A,RHS)

Algebra:
- Recap algebra so far
- Apply to solving linear inequalities in two variables

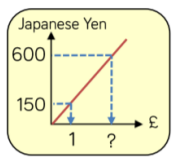
Linear graphs:
- y=mx+c including real life context (e.g. velocity time graphs)
- Rearrange equations to get in the implicit form
- Parallel and perpendicular lines
- Find y=mx+c from two given
- points, a point and a gradient
- Inequalities, shading regions.



Standard Form:
- Understand and convert into standard form
- Calculations

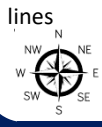
4.5×10^{-3}

Proportion:
- Unitary Method
- Recipe problems
- Best buy problems
- Exchange rates
- Inverse proportion problems
- Pie charts



YEAR 9

Bearings:
- Solve problems including angles in parallel lines

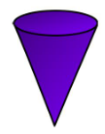


Construction and Scale Drawing:
- Construct triangles
- Use scale factors , diagrams and maps.

Statistics:
- Understand the data handling cycle and types of data
- Collect, organise and interpret data
- Tally charts, frequency tables, two-way tables, pictograms, bar charts, line graphs and pie charts
- Averages, including grouped data

Units, measures and conversions:
- Convert between different metric units for length, area and volume.
- Compound units: Speed, density, pressure (in numerical and algebraic contexts)
- Interpreting real life tables (e.g. timetables, distance tables)

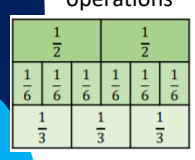
3D Shapes:
- Properties and names
- Volume and Surface area (prisms)
- Plans and elevations



Coordinates:
- In all four quadrants
- Recognise and sketch vertical and horizontal lines

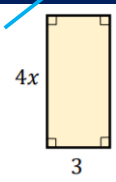
Algebra:
- Substitute into scientific formulae
- Expand up to three brackets
- Laws of indices
- Solve more complex equations including fractions, decimals and negatives
- Rearrange scientific formulae

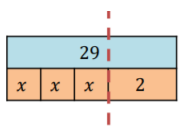
Fractions:
- Multiply and divide proper and improper fractions
- Above with negatives, algebra and order of operations



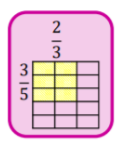
YEAR 8

Area and Perimeter:
- Composite shapes
- Trapezium
- Circles
- Sectors
- To include algebra, decimals and fractions.

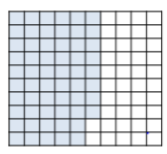




Inequalities:
- Represented on a number line
- Understand set notation
- Solve linear inequalities



Geometry:
- Understand points, lines, parallel and perpendicular lines, right angles, regular polygons and other polygons that are reflectively and rotationally symmetric.
- Properties of triangles, quadrilaterals and circles

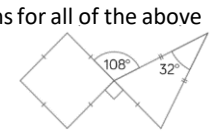


Percentages:
- As parts per hundred
- Convert from fraction, decimal and percentage
- Percentage of an amount
- Increase/decrease
- One quantity as a percentage of the other.
- Real life problems such as interest and use of a calculator.

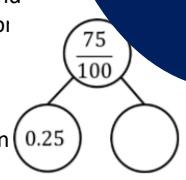
Algebra:
- Understand terminology and notation
- Substitution
- Simplify and manipulate (including area and perimeter)
- Solve simple linear equations
- All of the above including decimals, fractions and negatives

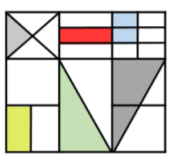
Algebra (Sequences):
- Recognise and use triangular, square, cube, Fibonacci and geometric sequences
- Understand arithmetic sequences and find the nth term
- All of the above with pictorial representation, fractions, decimals and negatives.

Angles:
- Use of a protractor
- Angle rules for a line, triangle full turn, parallel lines and polygons
- Form and solve equations for all of the above

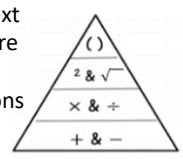


Fractions:
- Understand fractions including using diagrams
- Simplify fractions, Equivalent fractions leading to dividing a decimal by a decimal
- Compare and order fractions
- Mixed numbers and improper fractions
- Convert between fractions and decimals associating a fractio with division to convert any fraction to a decimal
- Lowest Common Multiple
- Add and subtract any fraction
- Find a fraction of an amount
- Find the whole given a fraction of an amount
- Find a fractional increase and decrease





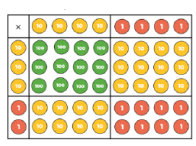
Negative Numbers:
- In a real life context
- Order and compare
- +,-,×,÷
- Order of Operations
- On a scientific calculator



Addition and Subtraction:
- Add and subtract integers and decimals of any size
- Real life context such as bank statements
- Using concrete, pictorial and written methods to solve complex addition and subtraction problems (bar modelling, part whole models, missing box problems)
- Perimeter

YEAR 7

Multiplication and Division:
- Including powers of ten
- Mental and written methods
- Squares, cubes and roots
- Order of Operations
- Multiples, factors and primes
- Area



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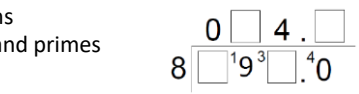
30	1,200	120
2	80	8



Place Value:
- Understand integers and decimals of any size
- Order positives, negatives and decimals
- Round and estimate