Year 9 Aspiring Higher (Set Ext, (9-8), (9-7))

Assessment 1a - End of September

This assessment is of number skills and rounding.

The new calculation skills we learn are calculations using *standard form*. However we also assess skills taught in years 7 and 8 which includes finding square and cube of a numbers, recognising the reciprocal of a number, and other manipulations of numbers with indices.

The assessment also looks at showing inequalities on a number line and the error bounds created by rounding numbers.

	☺	😐	☹	**Maths Watch**
Standard form				
I can use index notation for small powers				29
I can use square, cube and power functions on a calculator				
I can find the reciprocal of a number				76
I know that the reciprocal of the reciprocal is the original number				76
I can simplify expressions containing powers				34
I can use and interpret index notation with negative powers				154
I can use and interpret index notation with fractional powers				188
I can convert whole numbers between standard form and ordinary form				83
I can convert decimal numbers between standard form and ordinary form				83
I can list numbers given in standard form in ascending order of size				83
I can multiply and divide numbers in standard form without a calculator				83
I can recognise the difficulty in adding and subtracting numbers in standard form without a calculator and overcome this				83
I can find an estimate for powers and roots of a given number to 1dp				81
Inequalities and Rounding				
I recognise the symbols for identify and inequalities				
I can show inequalities on a number line				138
I can round a number to the nearest whole, ten, hundred, thousand				N27a
I can round a number to a specified number of decimal places				N27b
I can round a number to a specified number of significant figures				N38
I can use rounding to significant figures to help in estimating a calculation				91
I understand that rounding a number introduces an error into calculations and I can select an appropriate degree of accuracy for a final answer based on the rounding in the question				G29
I can find a lower bound and an upper bound for a value based on the rounding that has taken place for discrete data and use it to write an error interval				G29
I can find a lower bound and an upper bound for a value based on the rounding that has taken place for continuous data and use it to write an error interval				G29

Year 9 Aspiring Higher (Set Ext, (9-8), (9-7))

Assessment 1b – Mid November

This assessment is on algebra, proof and sequences

Students look again at solving *equations* extending their knowledge to include efficient methods for the solution of all types of *linear equation*s, including equations with brackets and fractions. This knowledge is then extended to look at describing and solving *inequalities*.

Students also explore different kinds of sequences, including arithmetic, geometric and Fibonacci style sequences, their associated notation and formulae. In addition students look at the concept of 'proof' – and how they can use algebraic techniques to show that something is true for all numbers.

	☺	😐	☹	**Maths Watch**
Sequences and Proofs				
I understand the notation used to describe sequences				
I can find a specific term in a sequence using position-to-term rules				A11b
I can recognise arithmetic, geometric and Fibonacci style sequences				A22
I can find a formula for an arithmetic sequence				A11c
I can find a formula for a quadratic sequence or a simple geometric sequence				
I can relate arithmetic and simple quadratic sequences to diagrams				
I can recognise that 2n represents an even number, 2n-1 an odd number and nx and n(ax + b) is a multiple of n.				
I can use algebra to construct proofs E.g. Show that the volume of a cube with side lengths of $(2x - 1)$cm is $(8x^3 - 12x^2 + 6x - 1)$cm^3				
Expressions and Equations				
I can simplify algebraic expressions by collecting like terms				A7a
I can multiply, add, subtract and divide with unknown numbers				A7a/b
I can substitute numbers into algebraic expressions				A10
I can substitute negative numbers and fractions into algebraic expressions				95
I can expand brackets				A8
I can expand double brackets				A18
I can factorise algebraic expressions				94
I can factorise quadratic algebraic expressions				157
I can solve linear equations that involve only one unknown number Eg 3x + 1 = x - 7				139
I can solve algebra equations containing brackets				139
I can solve algebra equations that containing fractions of the unknown				139
I can rearrange simple expressions to make an unknown the subject of the expression				136
I can solve algebra expressions by trial and improvement to give an estimate to 1 decimal place				A16, A25
I can solve a two stage word problem by converting it into an equation and solving it				A17
I can change the subject of more complex formula. E.g. Make u or v the subject of the formula 1/v + 1/u =1/t				136

I can change the subject of a formula where the new subject appears more than once. Eg. Make x the subject in ax + by = cx			190
Inequalities			
I can solve simple linear inequalities and represent the solution on a number line e.g. 3n + 2 <11 or 2n - 1 >1			
I can solve more complex inequalities and represent the solution on a number line e.g. -6 < 2n+4 or -9 < 2n + 3 < 7			139

Year 9 Aspiring Higher (Set Ext, (9-8), (9-7))

Assessment 2a – Mid January

This assessment is on Geometry and on Probability

In geometry we assess understanding of the properties of 2D shapes with an emphasis on proving results previously established in Years 7 and 8. We assess pupil's knowledge of congruence and similarity and we link the results from previous years into work on Bearings.

In Probability we look at both finding probability from experimental observation and at predicting theoretical probability by looking at all the possible outcomes. There is an emphasis on calculating probabilities for combined events.

	☺	😐	☹	Maths Watch
Geometry				
I can find the internal and external angles of regular polygons				123
I can use the angle rules for parallel lines				120
I can use bearing to describe direction				124
I can measure a bearing between the points on a map or scaled plan				124
I can calculate the bearing of a return journey				124
I can mark on a diagram the position of point *B* given its bearing from the point *A*				124
I can use the angle rules for parallel lines when calculating bearings				124
I recognise four transformations: translation, reflection, rotation and enlargement				48,49,50,148
I can enlarge 2-D shapes, given a positive whole number scale factor				148
I can enlarge shapes with a centre other than (0, 0)				148
I know that enlargements of 2D shapes produce similar shapes				
I can find the scale factor from the ratio of dimensions of similar shapes				R10
I can enlarge 2D shapes, given a fractional scale factor				148
I can transform shapes by a combination of several transformations and recognise the similarity of resulting shapes				182
I can demonstrate geometric proofs such as that the base angles of an isosceles triangle are equal.				
I can formally prove the congruence of triangles				12b,166
I can derive the fact that base angles of isosceles triangles are equal				
I can complete a formal geometric proof of similarity of two given triangles				144
Probability				
I can calculate probabilities from experimental data (relative frequencies)				125
I can compare relative frequencies from two different sets of data				125
I can describe what we mean by 'fair' in experimental measurements				
I can use sample space diagrams to solve probability problems involving two combined events				126
I can use probability tree diagrams to find probabilities for combined events				151
I can recognise when two events are independent or not				
I can use the AND and OR rules to calculate probabilities for combined events				204
I can use algebra to calculate probabilities for more complex problems				175

Year 9 Aspiring Higher (Set Ext, (9-8), (9-7))

Assessment 2b - End of March

The assessment is on percentages and geometry

Students need to be able to convert between fractions, decimals and percentages. Students need to be able to calculate percentage changes efficiently using multipliers. This work builds on the knowledge from year 8.

The assessment on geometry looks at finding the areas and perimeters of circles and sectors and uses the work on similar shapes from the last assessment to investigate properties of right angled triangles leading to Pythagoras' theorem and right angled trigonometry.

	☺	😐	☹	Maths Watch
Percentages				
I can find 10%, 20%, 25% of a whole number or of money.				
I can convert between fractions and percentages				85
I can calculate the percentage of an amount				86,87
I can calculate the outcome of percentage increase or decrease				108
I can find and use multipliers in percentage increase calculations (eg 15% increase can be found by multiplying with 1.15)				R9b
I can find and use multipliers in percentage decrease calculations (eg 15% decrease can be found by multiplying with 0.85)				R9b
I can use percentages in real world calculations such as interest, tax, profit and loss				
I can calculate simple interest				
I can calculate compound interest				164
I can solve complex problems using decimal multipliers for repeated percentage changes				164
I can solve reverse percentage problems				
Circles				
I know the names of parts of a circle				116,149
I can draw circles and arcs with a compass given the radius or diameter				
I recognise the symbol for pi				
I can use the formula for the circumference of a circle				118
I can use the formula for area of a circle				117
I can calculate with exact values (multiples of pi)				
I can find the perimeters and areas of semicircles and quarter circles				
Right angled triangles				
I can use Pythagoras to find the length of the side of a right angle triangle				150a,150b
I can use the trigonometric ratios (sin, cos, tan) to find an unknown angle of side length in a right angled triangle				G35b
I can use the trigonometric ratios (sin, cos, tan) to find an unknown side length in a right angled triangle				G35a
I can manipulate algebraic expressions involving trigonometric ratios				
I can solve problems with many steps using Pythagoras, algebra and trigonometric ratios.				

Year 9 Aspiring Higher (Set Ext, (9-8), (9-7))

Assessment 3a– Mid May

This assessment focuses on Statistics and Loci.

The assessment on statistics extends students' knowledge of mean, median, mode and range calculations with a focus on handling continuous data. We look at what information can be gained by comparing the interquartile range of two data sets, and at what we mean by cumulative frequency.

For geometry students look at what a locus is and how we can use a ruler and compass to construct accurate loci to solve problems.

	☺	😐	☹	**Maths Watch**
Statistics				
I can calculate the mean, median, mode and range of a list of numbers				62
I can find the mean, median, mode and range from a frequency table				130a
I can estimate the mean and median from grouped frequency tables				130b
I can compare data sets using the mean, median, mode and range				
I can discuss the value of mean, median and mode in representing particular data sets.				
I can record data in tally charts, frequency tables and grouped frequency tables				15
I can draw and interpret a frequency polygon				65b
I can compare data sets from graphical representation such as pie charts, bar charts and frequency polygons				
I can calculate lower quartile, upper quartile and interquartile range				
I can show median, range and interquartile range with box plots.				187
I can construct cumulative frequency tables				186
Loci and Constructions				
I can draw circles and arcs, including using compasses				
I can construct triangles, including equilateral triangles using compasses				147
I can construct the perpendicular bisector of a line				G26b
I can construct the bisector of an angle				G26c
I can describe the locus of a point or the loci of points from a diagram				165