GCSE

MATHEMATICS – NUMERACY

3310PF/PN/PH

November 2022 examinations

Unit 1	Non-calculator examination	Tuesday, 08 November 2022
Unit 2	Calculator-allowed examination	Thursday, 10 November 2022

Advance Information

General information for students and teachers

This advance information provides the focus of the content of the November 2022 examination papers.

It does not apply to any other examination series.

It is intended to support revision.

It may be used at any time from the date of release.

It must not be taken into the examination.

November 2022 GCSE Mathematics - Numeracy

Advance Information

This advance information is presented in two parts. The first part comprises a series of statements to clarify the knowledge, understanding and skills which are assumed for the November 2022 exams, as they are in all examination series. The second part shows, in tabular form, the topics which will be assessed in the November 2022 exams.

In the following overarching statements, you are reminded that underlined text indicates content that can only be assessed at intermediate tier and higher tier. Text in standard type can be assessed at any tier.

- The following basic number skills will be assumed in both units and at all tiers:
    - Reading and writing whole numbers of any magnitude expressed in figures or words.
    - Understanding place value and decimal places.
    - Using the equivalences between decimals, fractions, ratios, and percentages.
    - Converting numbers from one form into another.
    - Ordering and comparing whole numbers, decimals, fractions, and percentages.
    - Understanding and using number operations and the relationships between them, including inverse operations and the hierarchy of operations.
    - Addition, subtraction, multiplication and division of whole numbers, decimals, fractions, and negative numbers.
    - The use of a non-calculator method to multiply and divide whole numbers up to and including the case of multiplication and division of a three-digit number by a two-digit number.

- At each tier, the meaning of mathematical terms and vocabulary appropriate to that tier should be understood, including types and properties of numbers and shapes:
    - Using the common properties of numbers, including odd, even, multiples, factors, primes.
    - Using the terms square, square root, cube, cube root and reciprocal.
    - The geometrical terms: point, line, plane, parallel, right angle, clockwise and anticlockwise turns, perpendicular, horizontal, vertical, acute, obtuse and reflex angles, face, edge and vertex.
    - Vocabulary of triangles, quadrilaterals, and circles: isosceles, equilateral, scalene, exterior/interior angle, diagonal, square, rectangle, parallelogram, rhombus, kite, trapezium, polygon, pentagon, hexagon, radius, diameter, tangent, circumference, chord, arc, sector, segment.
    - Simple solid figures: cube, cuboid, cylinder, prism, pyramid, cone, sphere, tetrahedron.
    - Units of length, mass, capacity, area, volume, time.

- At each tier, the knowledge and understanding of all calculator functions appropriate to that tier will be assumed:
    - Interpreting numbers written in standard form in the context of a calculator display.
    - Using the facilities of a calculator, including the constant function, memory and brackets, to plan a calculation and evaluate expressions.
    - Using addition, subtraction, multiplication, division, square, square root, power, root, constant, memory, brackets and appropriate statistical functions.
    - Knowing how a calculator orders its operations. (Candidates will not be expected to list the key depressions that they have made.)
    - Using calculators effectively and efficiently.
    - Reading a calculator display correct to a specified number of decimal places or significant figures.
    - Using appropriate trigonometric functions on a calculator.

- In many cases, multiple descriptors from the specification have been grouped together under one brief descriptor in the advance information. This is so that the information is clear and concise. Also, this is to help ensure that the breadth of the specification content relevant to those topics is learnt and revised.

In the tables that follow, a tick (✓) indicates that the topic(s) specified will be assessed in that unit in November 2022. The information is provided in the order of the sections in the specification, not in question order. The format and structure of the exams remain unchanged.

Foundation Tier (papers 3310U10-1 & 3310U20-1)

Section	Topic descriptor(s)	Unit 1 (✓)	Unit 2 (✓)
Number			
Understanding Number and Place Value	Rounding (e.g., nearest 10, whole numbers, decimal places)	✓	✓
	Directed numbers	✓	✓
Understanding number relationships and methods of calculation	Fraction / percentage of an amount	✓	✓
	Expressing a number as a fraction / percentage of another	✓	✓
	Fractional and percentage changes	✓	✓
	Estimation and approximation	✓	
Solving numerical problems	Interpretation and use of mathematical information, e.g., charts, timetables, schedules	✓	✓
	Calculations involving basic knowledge of money; pounds (£) and pence	✓	✓
	Calculations involving household bills.		✓
	Calculations involving personal finance, discounts, saving and VAT	✓	✓
	Calculations involving best buys	✓	
	Calculations involving wages and salaries	✓	
	Profit and loss	✓	
	Exchange rates		✓
Algebra			
Functional relationships	Number patterns and sequences	✓	✓
Equations and formulae	Substitution	✓	
	Linear equations	✓	

Foundation Tier (continued)

Section	Topic descriptor(s)	Unit 1 (✓)	Unit 2 (✓)
Geometry and Measure			
Properties of shape	Accurate use of ruler, compasses, and protractor (may include drawing shapes accurately, but not constructing shapes with compasses)		✓
	Basic angle facts (vertically opposite angles, angles at a point, angles on a straight line	✓	✓
	Further angle facts (may include parallel lines, triangles)		✓
Properties of position, movement, and transformation	Scales	✓	
Measures	Using and converting metric and Imperial units		✓
	Calculations involving time	✓	✓
	Estimating area of irregular shapes	✓	
	Perimeter and area of shapes	✓	
Statistics			
Processing, representing, and interpreting data	Sorting, classification, and tabulation of data		✓
	Grouped data		✓
	Tallying methods		✓
	Bar charts / pie charts		✓
	Frequency diagrams		✓
	Averages and range		✓
	Scatter diagrams	✓	

Intermediate Tier (papers 3310U30-1 & 3310U40-1)

Section	Topic descriptor(s)	Unit 1 (✓)	Unit 2 (✓)
Number				
Understanding Number and Place Value	Rounding (e.g., whole numbers, decimal places, significant figures)		✓
Understanding number relationships and methods of calculation	Standard form	✓	
	Fraction / percentage of an amount	✓	✓
	Expressing a number as a fraction / percentage of another	✓	✓
	Fractional and percentage changes	✓	✓
	Repeated proportional changes / appreciation and depreciation		✓
	Calculating using ratios, proportional division, direct and inverse proportion	✓	
	Estimation and approximation	✓	
Solving numerical problems	Interpretation and use of mathematical information, e.g., charts, timetables, schedules	✓	
	Calculations involving basic knowledge of money; pounds (£) and pence	✓	✓
	Calculations involving household bills		✓
	Calculations involving taxation, including VAT	✓	✓
	Calculations involving best buys	✓	
	Calculations involving wages and salaries	✓	
	Profit and loss	✓	
	Finding original amounts (given the results of proportional changes)		✓
	Exchange rates		✓
	Upper and lower bounds		✓
Algebra				
Equations and formulae	Changing the subject of a formula	✓	

Intermediate Tier (continued)

Section	Topic descriptor(s)	Unit 1 (✓)	Unit 2 (✓)
Geometry and Measure			
Properties of shape	Accurate use of ruler, compasses, and protractor (may include drawing shapes accurately, but not constructing shapes with compasses)	✓	✓
	Basic angle facts (vertically opposite angles, angles at a point, angles on a straight line)		✓
	Further angle facts (may include parallel lines, triangles)		✓
	Pythagoras's Theorem		✓
	Right-angled triangle trigonometry		✓
Properties of position, movement, and transformation	Similar shapes	✓	
	Scales / scale drawings	✓	
	Maps	✓	
	Bearings	✓	
	Loci	✓	
Measures	Using and converting metric units	✓	✓
	Using and converting metric and Imperial units	✓	
	Calculations involving time	✓	✓
	Compound measures – speed		✓
	Compound measures – density and population density		✓
	Compound measures – flow rates (e.g., m^3 per hour, litres per second)	✓	
	Perimeter and area of shapes	✓	
	Surface area / area of cross-sections / volume	✓	
Statistics			
Specifying the problem and planning	Systematic sampling		✓
Processing, representing, and interpreting data	Grouped data	✓	✓
	Pie charts		✓
	Frequency diagrams		✓
	Cumulative frequency	✓	
	Averages and spread	✓	✓
	Comparing two distributions	✓	
	Box-and-whisker diagrams	✓	
	Scatter diagrams	✓	

Higher Tier (papers 3310U50-1 & 3310U60-1)

Section	Topic descriptor(s)	Unit 1 (✓)	Unit 2 (✓)
Number			
Understanding Number and Place Value	Rounding (e.g., whole numbers, decimal places, significant figures)	✓	✓
Understanding number relationships and methods of calculation	Standard form	✓	
	Fraction / percentage of an amount	✓	✓
	Expressing a number as a fraction / percentage of another	✓	
	Fractional and percentage changes	✓	✓
	Repeated proportional changes / appreciation and depreciation	✓	✓
	Calculating using ratios, proportional division, direct and inverse proportion (intermediate level)	✓	
	Direct and inverse proportion (higher level)	✓	
	Using surds and π in exact calculations	✓	
	Simplifying surds	✓	
	Estimation and approximation	✓	
Solving numerical problems	Interpretation and use of mathematical information, e.g., charts, timetables, schedules		✓
	Calculations involving taxation, including VAT		✓
	Calculations involving personal finance, discounts, saving, investing and AER (higher level)		✓
	Finding original amounts (given the results of proportional changes)		✓
	Upper and lower bounds (intermediate level)		✓
	Upper and lower bounds (higher level)	✓	
Algebra			
Functional relationships	Area under a graph / trapezium rule	✓	
Equations and formulae	Substitution	✓	✓
	Formation of algebraic expressions (higher level)	✓	
	Changing the subject of a formula (intermediate level)	✓	
	Changing the subject of a formula (higher level)		✓

Higher Tier (continued)

Section	Topic descriptor(s)	Unit 1 (✓)	Unit 2 (✓)
Geometry and Measure		
Properties of shape	2-D representations of 3-D shapes	✓	✓
	Accurate use of ruler, compasses, and protractor (may include drawing shapes accurately, but not constructing shapes with compasses)	✓	
	Basic angle facts (vertically opposite angles, angles at a point, angles on a straight line)		✓
	Further angle facts (may include parallel lines, triangles)		✓
	Pythagoras's Theorem (2D)	✓	✓
	Pythagoras's Theorem (3D)		✓
	Right-angled triangle trigonometry		✓
	Sine rule / cosine rule		✓
Properties of position, movement and transformation	Similar shapes (intermediate level)	✓	
	Similar shapes (higher level)		✓
	Scales / scale drawings	✓	
	Maps	✓	
	Bearings	✓	✓
	Loci	✓	
Measures	Using and converting metric units	✓	✓
	Using and converting metric and Imperial units	✓	
	Calculations involving time	✓	✓
	Compound measures – speed		✓
	Compound measures – density and population density		✓
	Compound measures – flow rates (e.g., m^3 per hour, litres per second)	✓	
	Perimeter and area of shapes	✓	✓
	Surface area / area of cross-sections / volume (intermediate level)	✓	
	Arcs, sectors, and segments of circles	✓	✓
	Surface area / volume (higher level)	✓	✓
Statistics		
Specifying the problem and planning	Systematic sampling		✓
Processing, representing, and interpreting data	Grouped data	✓	✓
	Cumulative frequency	✓	
	Averages and spread (intermediate level)	✓	✓
	Averages (higher level)	✓	
	Comparing two distributions	✓	
	Box-and-whisker diagrams	✓	
	Histograms / frequency density	✓	

End of advance information