

SUBJECT: Mathematics	GCSE YEAR 11
EXAM BOARD: WJEC	EXAM DATES: Paper 1: Linear 21 st of May Paper 2: Linear 4 th of June
TYPE OF EXAMINATION/S: Linear	

RECOMMENDED NUMBER OF HOURS REVISION REQUIRED PER WEEK: 3-4 hours

CHECKLIST OF KEY TOPICS & AREAS OF THE SUBJECT TO REVISE AND LEARN:

HIGHER ONLY! GRADE A TO A* QUESTIONS - NUMBER	MATHS WATCH CLIP NO.
Recurring Decimals	155
Fractional and Negative Indices	156
Surds	157
Rationalising the Denominator	158
Direct and Inverse Proportion	159
Upper and Lower Bounds	160
GRADE B QUESTIONS - NUMBER	MATHS WATCH CLIP NO.
Standard Form	135
Percentage Increase and Decrease	136
Compound Interest and Depreciation	137
Reverse Percentage	138
Four Rules of Fractions	139
GRADE A TO A* QUESTIONS – GEOMETRY/SHAPE	MATHS WATCH CLIP NO.
Enlargements by Negative Scale Factor	171
Loci	172
Sine and Cosine Rules	173
Areas of Triangles using $\frac{1}{2}ab \sin C$	176
Cones, Spheres, Segments, Congruent Triangles	177, 178, 179
GRADE B QUESTIONS – GEOMETRY/SHAPE	MATHS WATCH CLIP NO.
Trigonometry	147
Similar Shapes	149
Circle Theorems	150

HIGHER ONLY! GRADE A TO A* QUESTIONS - ALGEBRA	MATHS WATCH CLIP NO.
Solving Quadratics by using the Formula and Completing the Square	161, 162
Algebraic Fractions	163
Rearranging difficult Formulae	164
Simultaneous Equations involving a Quadratic	165
Gradient of Parallel and Perpendicular Lines	166

Transformation of Functions	167
GRADE B QUESTIONS - ALGEBRA	MATHS WATCH CLIP NO.
Solving Quadratics by Factorisation	
The Difference of two squares	
Simultaneous Linear Equations	147
Understanding $y = mx + c$	148
Regions	149
Graphs of Cubic and Reciprocal Fractions	150
Recognise the Shapes of Functions	

GRADE A TO A* QUESTIONS – DATA COLLECTION	
Histograms	181
Probability “And”, & “Or” Questions	182
GRADE B QUESTIONS – DATA COLLECTION	
Cumulative Frequency	151
Simple and Harder Tree Diagrams	153, 154

Foundation and Higher

GRADE C QUESTIONS - NUMBER	MATHS WATCH CLIP NO.
Percentages – Overview, Increase/decrease by a %	92, 93
Ratio	94
Product of Prime Factors, HCF and LCM	95, 96
Using Place Value	97
Recurring Decimals into Fractions	98
Four Rules of Negatives	99
Division by 2-Digit Decimals	100
Estimating Answers	101
GRADE D QUESTIONS - NUMBER	MATHS WATCH CLIP NO.
Factors, Multiples, Primes, Powers, Squares, Cubes and Roots	44, 45, 46,
Fractions : Equivalent, Simplify, Ordering, Find Fractions of Amounts, Adding, Subtraction, Multiplication and Division, Changing Fractions to Decimals	47, 48, 49, 55, 56, 57, 58
Percentage of Amount WITH and WITHOUT Calculator	51, 52
Change to a Percentage WITH and WITHOUT Calculator	53, 54
BIDMAS	59
Long Multiplication with Decimals	60
Ratio	61
Proportion Recipe Type Questions	62
Hard Calculator Questions	63
GRADE E, F AND G QUESTIONS - NUMBER	MATHS WATCH CLIP NO.

Place Value, Ordering Numbers, Rounding to Nearest 10, 100 and 1000, Place Value when Multiplying, Rounding to Decimal Places	1, 2, 3, 15, 20
Reading Scales	4
Powers, Multiply and Divide by Powers of 10	26, 5
Negatives in Real Life, Multiply and Divide with Negatives	6, 7
Square and Cube Numbers	9
Fraction of an Amount, Fractions, Decimals, Percentages (and Ordering of Fractions, Decimals and Percentages), Shading Fractions of Rectangles,	8, 10, 13, 12
Money Questions	11
Estimation	14
Addition and Subtraction, Long Multiplication and Division, Multiplication and Division with Decimals, Half-Way values	16, 17, 18, 19, 21
Reciprocals	22
Proportion	23
Distance Tables	24
Timetables	25

GRADE C QUESTIONS – GEOMETRY/ SHAPE	MATHS WATCH CLIP NO.
Pythagoras' Theorem, Line on a Graph	118, 119
Surface Area of Cuboids, Triangular Prisms	120, 121
Volume of a Prism	122
Similar Shapes	123
Converting Metric Units	124
Bounds	125
Compound Measures	126
Drawing: Bisecting a Line, Drawing a Perpendicular to a Line, Bisecting an Angle, Loci, Bearings	127, 128, 129, 130, 131
GRADE D QUESTIONS – GEOMETRY/SHAPE	MATHS WATCH CLIP NO.
Angles: Between Parallel lines, in Triangles, Properties of Special Triangles, Regular Polygons	67, 68, 69, 70
Circles, Area and Circumference	71, 72
Area of Compound Shapes	73
Transformations: Rotations, Reflections, Enlargements, Translations	74, 75, 76, 77
Drawing: Finding the Midpoint of a Line, Measuring and Drawing Angles, Drawing Triangles, Plans and Elevations, Nets	78, 79, 80, 81, 82
Symmetries	83
GRADE E, F AND G QUESTIONS – GEOMETRY/SHAPE	MATHS WATCH CLIP NO.
Angles	31
Congruent and Similar Shapes	32

Perimeters and Areas	33
Volume of Cuboids	34
Converting Metric Measures	35
Triangles, Quadrilaterals, Polygons	36
Names of Solids	37
Tessellations	38
Isometric Drawing	39

GRADE C QUESTIONS - ALGEBRA	MATHS WATCH CLIP NO.
Simplifying, expanding and simplifying brackets, Factorisation	102, 103, 104
Forming and Solving Equations	105, 106
Changing the Subject of a Formula	107
Inequalities, and solving Inequalities	108, 109
Trial and Improvement	110
Index Notation for Multiplication and Division	111
Finding the nth Term	112
Drawing Straight Line Graphs, Finding Equation of Straight Line	113, 114
Solving Simultaneous Equations Graphically	115
Drawing Quadratic Graphs and Real-Life Graphs	116, 117
GRADE D QUESTIONS - ALGEBRA	MATHS WATCH CLIP NO.
Generate a Sequence from the nth Term	65
Substitution	66
GRADE E, F AND G QUESTIONS - ALGEBRA	MATHS WATCH CLIP NO.
Line Graphs, Coordinates	27, 28
Number Sequences, Number Machines	29, 30

GRADE C QUESTIONS – DATA COLLECTION	MATHS WATCH CLIP NO.
Experimental Probabilities	132
Averages from a Table	133
Designing a Questionnaire	134
GRADE D QUESTIONS – DATA	MATHS WATCH CLIP NO.
Questionnaires and Data Collection	84
Charts/Graphs: Two-Way Tables, Pie Charts, Scatter Graphs, Frequency Diagrams	85, 86, 87, 88, 89
Probability: Simple Probability and Mutually Exclusive Events	90, 91
GRADE E, F AND G QUESTIONS – DATA COLLECTION	MATHS WATCH CLIP NO.
The Probability Scale	40
Mean, Median, Mode, Range (The Averages)	41
Pictograms	42
Conversion Graphs	43

GCSE MATHEMATICS SUBJECT SPECIFIC TERMS & VOCABULARY NEEDED FOR THE EXAM:

A

Acute angle An angle less than 90° .

Adjacent Adjacent sides are next to each other and are joined by a common vertex.

Algebra Algebra is the branch of mathematics where symbols or letters are used to represent

numbers. **Angle** An angle is formed when two straight lines cross or meet each other at a point. The size of an angle is measured by the amount one line has been turned in relation to the other.

Approximate An approximate value is a value that is close to the actual value of a number.

Arc Part of a circumference of a circle.

Area The amount of space a shape takes up. E.g. the area of the lawn is 35 square metres.

Asymmetrical A shape which has no lines of symmetry.

Average A value to best represent a set of data. There are three type of average - the mean, the median and the mode.

Axis An axis is one of the lines used to locate a point in a coordinate system.

B

Bearing A three digit angle measured from north in a clockwise direction.

BIDMAS A way of remembering the order in which operations are carried out. It stands for Brackets - Indices - Division - Multiplication - Addition - Subtraction.

Bisect To divide an angle or shape exactly in half.

Brackets Used to determine the order in which operations are carried out. For example, $3 + 4 \times 2 = 11$ but $(3 + 4) \times 2 = 14$.

C

Calculate To work out the value of something. This does not have to mean you need a calculator!

Centilitre (cl) A measure of volume. 100 centilitres = 1 litre ($100 \text{ cl} = 1 \text{ l}$). 1 centilitre = 10 millilitres ($1 \text{ cl} = 10 \text{ ml}$).

Centimetre (cm) A measure of distance. 1 centimetre = 10 millimetres. ($1 \text{ cm} = 10 \text{ mm}$). 100 centimetres = 1 metre. ($100 \text{ cm} = 1 \text{ m}$).

Chord A straight line drawn from one point on the edge of a circle to another.

Circumference The perimeter of a circle.

Coefficient The number in front of an algebraic symbol. For example the coefficient of $5x$ is 5.

Congruent If you can place a shape exactly on top of another then they are said to be congruent. You may rotate, reflex or translate the shape.

Constant A letter or symbol whose value always stays the same. The constant π is a common example.

Credit To add money to a bank account. For example, I had £500 credited to my bank account.

Cross section The end section created when you slice a 3D shape along it's length.

Cube number The product when an integer is multiplied by itself twice. For example $5 \text{ cubed} = 5 \times 5 \times 5 = 125$.

Cuboid A 3D shape with all sides made from rectangles.

Cumulative frequency A running total of the frequencies, added up as you go along.

D

Day A time period of 24 hours. There are 7 days in a week.

Debit To take out money from a bank account. For example, £400 was debited from my account.

Decagon A ten sided polygon.

Decimal Not a whole number or integer. For example, 3.6 or 0.235.

Decrease To make an amount smaller.

Denominator The bottom part of a fraction.

Diameter The distance across a circle which passes through the centre.

Difference Subtract the smaller value from the larger value to find the difference between two numbers.

Distance How far away an object is. For example, it is a distance of 3 miles to the city centre.

Distribution How data is shared or spread out.

E

Equal Used to show two quantities have the same value.

Equation Two expressions which have the same value, separated by an '=' sign. E.g. $3y = 9 + y$

Equilateral triangle A triangle with all sides and angles the same size.

Estimate To find an approximate answer to a more difficult problem. E.g. 31.2×5.94 is roughly equal to $30 \times 6 = 180$.

Even number Any number which is a multiple of 2. Even numbers always end in 2, 4, 6, 8 or 0.

Expand To multiply out brackets in an expression. For example, $2(3x + 7) = 6x + 14$.

Expression A collection of terms which can contain variables (letters) and numbers. E.g. $4pq - q + 7$

F

Factor A number that divides another number exactly. E.g. 4 is a factor of 12.

Factorise To put an expression into brackets by taking out a common factor. For example, $20x + 15y = 5(4x + 3y)$.

Figures Another name for numbers. For example one thousand and fifty in figures is 1050.

Formula An equation used to describe a relationship between two or more variables.

Frequency How many times something happens. Another word for 'total'. Frequency

density The frequency divided by the class width.

G

Gradient How steep a line is. Found by dividing the distance up by the distance across. Gram

(g) A measure of mass. 1 gram = 1000 milligrams. (1 g = 1000 mg)

H

HCF Stands for 'highest common factor'. It is the largest factor common to a set of numbers. E.g. The HCF of 16 and 24 is 8.

Heptagon A seven sided polygon.

Hexagon A six sided polygon.

Histogram A diagram drawn with rectangles where the area is proportional to the frequency and the width is equal to the class interval.

Hypotenuse The longest side on a right angled triangle.

I

Increase To make an amount larger.

Indices Another name for powers such as 2 or 3 .

Integer A whole number.

Inter-quartile range (IQR) The difference between the upper and lower quartile.

Irrational A decimal which is never ending. It must also not be a recurring decimal.

J

Justify Another word for 'explain'. Often crops up on your maths exam. E.g. 'Calculate the mean and range for each player. Who is the better player Justify your answer.'

K

Kilogram (Kg) A measure of mass. 1 kilogram = 1000 grams. (1 kg = 1000 g)

Kilometre (Km) A measure of distance. 1 kilometre = 1000 metres. (1 km = 1000 m)

L

LCM Stands for 'lowest common multiple'. It is the smallest multiple common to a set of numbers. E.g. The LCM of 3 and 4 is 12.

Litre (l) A measure of volume. 1 litre = 100 centilitres (1 l = 100 cl). 1 litre = 1000 millilitres (1l = 1000 ml).

Loci The plural of locus.

Locus A collection of points which are the same distance from another point or line. Lower range The smallest value in a set of data.

M

Mean A type of average found by adding up a list of numbers and dividing by how many numbers are in the list.

Median The middle value when a list of numbers is put in order from smallest to largest. A type of average.

Metre (m) A measure of distance. 1 metre = 100 centimetres. (1 m = 100 cm).

Millilitre (ml) A measure of volume. 10 millilitres = 1 centilitre (10 ml = 1 cl). 1000 millilitres = 1 litre (1000 ml = 1 l).

Millimetre (mm) A measure of distance. 10 millimetres = 1 centimetre. (10 mm = 1 cm). Modal Another term for mode

Mode The most common value in a list of numbers. If two values are tied then there is two modes. If more than two values are tied then there is no mode. A type of average.

Month A time period of either 28, 30 or 31 days. There are 12 months in a year.

Multiple A number which is part of another number's times table. E.g. 35 is a multiple of 5.

N

Natural number A positive integer Negative

A value less than zero Nonagon A nine sided polygon.

Numerator The top part of a fraction.

O

Obtuse angle An angle between 90 and 180 .

Octagon An eight sided polygon.

Odd number A number that is not a multiple of 2. Odd numbers always end in 1, 3, 5, 7 or 9. Operation

An action which when applied to one or more values gives an output value. The four most common operations are addition, subtraction, multiplication and division.

P

Parallel Two or more lines which are always the same distance apart.

Parallelogram A quadrilateral with two pairs of parallel sides.

Pentagon A five sided polygon.

Perimeter The distance around a shape.

Perpendicular Two or more lines which meet at right angles.

Pi (π) An irrational constant used when calculating the area and circumference of circles. It is approximately equal to 3.14.

Polygon A shape made from straight lines.

Positive number A number greater than zero.

Prime A number which has exactly two factors. The number one and itself.

Prism A 3D shape with the same cross section all along its length.

Probability A measure of how likely an event is to occur.

Product The answer when two values are multiplied together.

Q

Quadratic equation An equation where the highest power is two. For example $x^2 + 4x + 6 = 0$ is a quadratic equation.

Quadrilateral A four sided polygon.

R

Radius The distance from the centre of a circle to its circumference. The plural of radius is radii.

Random sampling A method of choosing people at random for a survey.

Range The largest number take away the smallest value in a set of data.

Rational A decimal number which ends or is recurring.

Reciprocal The reciprocal of any number is 1 divided by the number. E.g. the reciprocal of 3 is $1/3$., the reciprocal of $3/4$ is $4/3$.

Recurring A decimal which never ends but repeats all or parts of the sequence of numbers after the decimal point. E.g 0.333333 or 0.141414.

Reflex angle An angle greater than 180 .

Regular A shape with all sides and angles the same size.

Remainder The amount left over when a number cannot be divided exactly. For example, 21 divided by 4 is 5 remainder 1.

Right angle An angle of 90 .

Rotation To turn a shape using an angle, direction and centre of rotation.

Round To reduce the amount of significant figures or decimal places a number has. For example £178 rounded to the nearest £10 is £180.

S

Scale

Scale factor How many times larger or smaller an enlarged shape will be.

Segment An area of a circle enclosed by a chord.

Sequence A list of numbers which follows a pattern. For example 6, 11, 16, 21, ...

Simplify To write a sum, expression or ratio in its lowest terms. For example 4:10:6 can be simplified to 2:5:3.

Solid A 3D shape.

Solve To find the missing value in an equation.

Speed How fast an object is moving. Average speed = Total distance divided by time taken. Square

number The product when an integer is multiplied by itself. For example, 1, 4, 9, 16, 25, 36, 49, 64, 81, 100.

Sum The answer when two or more values are added together.

Surface area To total area of all sides on a 3D shape.

Symmetrical A shape which has at least one line of symmetry.

T

Tally A system of counting where every group of four vertical lines is followed by a horizontal line to easily count in steps of five.

Tangent A straight line that just touches a point on a curve. A tangent to a circle is perpendicular to the radius which meets the tangent.

Term A number, variable or combination of both which forms part of an expression.

Transformation The collective name for reflections, rotations, translations and enlargements.

Translation To move a shape from one position to another by sliding in the x-axis followed by the y-axis.

Trapezium A quadrilateral with one pair of parallel sides.

Tree diagram A method of solving probability questions by listing all the outcomes of an event.

Probabilities are calculated by multiplying down the branches.

Triangle A three sided polygon.

Triangular number A sequence of numbers generated by adding one more than was added to find the previous term. For example, 1, 3, 6, 10, 15, 21, ...

U

Units A quantity used to describe a measurement. Examples are kilograms, metres and centilitres.

Upper range The largest value in a set of data.

V

Value A numerical amount or quantity.

Variable A letter which we don't know the value of.

Volume The amount an object can hold. E.g. a bottle of cola has a volume of 2 litres.

W

Week A time period of 7 days.

Wide Used to describe the width of something

Width The distance from side to side. E.g. 'The swimming pool is 10 metres wide.'

X

X-Axis The horizontal axis on a graph. The line going across the page.

Y

Y-Axis The vertical axis on a graph. The line going from top to bottom.

Y-Intercept The value of the y-coordinate when a graph crosses the y-axis. Year

A time period of 12 months or 365 days. (366 in a leap year.)

Z

Z-Axis Represents the depth of an object when working with 3D coordinates.