GCSE Mathematics
15 week revision timetable for Higher Tier

Exam advice

- Make sure you have all the necessary equipment
- Write in black or blue ink
- For diagrams use an HB pencil, but it should not be too sharp
- Add to diagrams if appropriate
- Underlining key words in the question may help to focus your mind
- Show all your workings in the space provided for each question
- Don't alter your working – cross it out and replace it
- Don't give the markers a choice of answers or methods
- Before rounding, show more figures than the question asks for
- Make a rough estimate of calculations. When estimating work to 1sf.
- Whenever possible, ask yourself "is my answer sensible?"
- Check your answers
- Don't take measurements from a diagram, if you are told that it is not accurately drawn
- Tracing paper is useful for transformations, use it if available.
- Show all construction lines. Do not rub any out.
- Don't rush but use time carefully
- Use the mark scheme to inform your answers
- Check the units given in the question and in your answer
- Remember to use your calculator during the calculator paper.
- And the obvious – "dnt use txt or slng in xams coz xminrs nd 2 no what u r saing".

When revising…….

- don't leave your revision until the night before the examination
- create a revision timetable and stick to it
- study in a place where you can concentrate
- do lots of questions, especially past examination questions
- start revising by topics and nearer the examination mix up the questions
- focus on your weaker topics but revise others as well
- learn formula and facts off by heart, consider writing prompt sheets
- remember to use diagram, statement, working answer, units
- know which level and which paper the topics are aimed at
- consider using a revision workbook
- use Maths Watch CD Rom or online revision websites if you enjoy working in that way.

Some useful websites……

- www.mymaths.co.uk
- www.mrbartonmaths.com
- www.samlearning.com
- www.bbc.co.uk/education/gcsebitesize/maths

Check you understand these key terms

- Write down
- Work out, solve or calculate
- Estimate
- Simplify or simplify fully
- Factorise or factorise completely
- Expand, expand and simplify or multiply out
- Give reasons
- Compare the two sets of data
- Describe or describe fully
- Sketch
- Construct
- Make an accurate drawing
- Measure
- Question asterisked or QWC or *20

Here is a summary of the topics to be covered in this revision timetable

Weeks before the exam	Topic
15.	Area and volume
14.	Angles
13.	Number
12.	Solving equations
11.	Statistical charts
10.	Graphs and transformations
9.	Percentages, decimals and fractions
8.	Pythagoras and trigonometry
7.	Further algebra
6.	Probability
5.	Statistical analysis
4.	Further Trigonometry
3.	Proportion and ratio
2.	Accuracy, dimensions and errors
1.	Vectors

Weeks to go: **15**	Topic: Area and Volume

Can you…

-Calculate the circumference and area of a circle
-Calculate the area of a trapezium
-Calculate the volume of prisms and cylinders
-Calculate the length of an arc and the area of a sector
-Calculate the surface area of cylinders, cones and spheres
-Calculate the volume of pyramids, cones and spheres
-Calculate the volume and surface area of compound 3D shapes

RAG

Own notes:

Facts:

Area of Circle = πr^2
Circumference of Circle = $2\pi r$
Area of a Trapezium = $\frac{1}{2}(a + b)h$
Volume of a cylinder = $\pi r^2 h$
Volume of a pyramid = 1/3 Ah
*Volume of a cone = 1/3 $\pi r^2 h$
*Curved surface area of a cone = πrl
*Volume of a sphere = 4/3 πr^3
*Surface area of a sphere = $4\pi r^2$
(* = on formula sheet)

Key Words:

Trapezium, Pi (π), Sector, Segment, Arc, Diameter, Radius, Prism, Cylinder, Pyramid, Sphere, Surface Area, Slant Height, Vertical Height

Weeks to go: **14**	Topic: **Angles**

Can you…		RAG	**Own notes:**
- Find angles in triangles and quadrilaterals - Find interior and exterior angles in polygons - Find angles on parallel lines - Remember and use all the circle theorems - Use the alternate segment theorem			

Facts:	**Key Words:**
Angles in a triangle add up to 180° Angles in a quadrilateral add up to 360° Exterior angles add up to 360° Interior angle + Exterior angle = 180° Interior angles add up to 180, 360, 540, 720, 900, 1080……. Alternate angles are equal Corresponding angles are equal There are 9 circle theorems to remember!	Equilateral triangle, Isosceles triangle, Kite, Parallelogram, Rhombus, Trapezium, Alternate angles, Corresponding angles, Interior angles, Exterior angles, Polygon, Cyclic Quadrilateral, Tangent, Alternate segment

Weeks to go: **13**	Topic: **Number**

Can you…		RAG	**Own notes:**
-do basic arithmetic in whole numbers and decimals - write a number as a product of primes - work out the LCM and HCF of a pair of numbers -estimate calculations -use the rules of indices - write numbers in standard form and use them in various problems -simplify surds - manipulate expressions containing surds and rationalise denominators - solve problems using surds			

Facts:

When estimating round to 1sf.

$y^m \times y^n = y^{m+n}$

$y^m \div y^n = y^{m-n}$

$(y^m)^n = y^{mn}$

$y^0 = 1$

$y^{1/n} = \sqrt[n]{y}$

$y^{-n} = 1/n$

$A \times 10^n$ where $1<A<10$ and n is a whole number

$\sqrt{n} \times \sqrt{n} = n$

Key Words:

Rationalise, Surd, Multiple, Factor, Lowest Common Multiple, Highest Common Factor, Powers, Standard Form, Prime Factor,

Weeks to go: **12**	Topic: **Solving Equations**

Can you…		RAG	**Own notes:**
- solve simple linear equations - solve linear equations with unknowns on both sides of the equals sign or brackets -solve equations using trial and improvement - solve simultaneous equations with same coefficients - solve simultaneous equations with different coefficients - solve quadratic equations by factorising - solve quadratic equations using the quadratic formula - solve quadratic equations using completing the square			

Facts:	**Key Words:**
Linear equations just involve 'x' terms. Quadratic equations involve 'x^2' terms. Full working must be shown on trial and improvement questions. Equations must 'balance' when you solve them. Quadratic equations must equal zero before you try to solve them. Simultaneous equations will have two solutions.	Linear equation, Quadratic equation, Solve, Trial and improvement, decimal place, Simultaneous equations, Coefficient, Inverse, Factorisation

Weeks to go: **11**	Topic: **Statistical Charts**

Can you…		RAG	**Own notes:**
- draw a frequency polygon - draw a stem and leaf diagram - draw a scatter diagram with a line of best fit - design and criticise questionnaires - draw a cumulative frequency diagram - draw and interpret box plots - draw histograms with unequal class intervals -write sentences to compare distributions			

Facts:	**Key Words:**
IQR=Q_3-Q_1 On a cumulative frequency graph plot at the end of the group. On a histogram the area of bar = frequency	Continuous, discrete, frequency polygon, histogram, class interval, interquartile range, lower quartile, upper quartile, median, bias, leading question, hypothesis, stem and leaf diagram, line of best fit, correlation (positive, negative and none), scatter diagram, variable, cumulative frequency, skew, box plot.

Weeks to go: **10**	Topic: **Graphs and Transformations**

Can you…		RAG	**Own notes:**
- draw straight lines by plotting points - draw straight lines using the gradient-intercept method - draw quadratic graphs using a table of values - recognise the shapes of graphs - solve equations using the intersection of graphs - use trigonometric graphs - reflect a shape in any given line - translate a shape by a vector - rotate a shape about a given point - enlarge a shape from a given centre - transform the graph of a given function			

Facts:	**Key Words:**
Use mark scheme when describing transformations fully.	Enlargement, Reflection, Rotation, Transformation, Translation, Centre of enlargement, Scale Factor, Angle of rotation, Clockwise, Anti-clockwise, Centre of Rotation, Mirror line, Object, Reflection, Vector, Coefficient, Gradient, Intercept, Linear graph, Quadratic graph, Asymptote, Cubic, Reciprocal, Exponential, Function

Weeks to go: **9**	Topic: **Percentages, Decimals and Fractions**

Can you…		RAG	**Own notes:**
- Write one quantity as a fraction of another - Add, subtract, multiply and divide fractions - Calculate percentage increases and decreases - Calculate with mixed numbers - Work out compound interest problems - Do reverse percentage problems - Solve complex problems involving percentage increases and decreases - Convert recurring decimals to fractions			

Facts:	**Key Words:**
- $\frac{1}{2}$ = 0.5 = 50% - $^1/_3$ = 0.333…. = 33.333…% - $^3/_{10}$ = 0.3 = 30% - You can find equivalence between all fractions, percentages and decimals - When adding, subtracting or comparing fractions, you need to first find equivalent fractions with lowest common denominator - 115% = 1.15 – This decimal can be used as a multiplier in calculations - For problems involving compound interest – total amount = Principal x multiplier raised to the power *n* (time)	Cancel, fraction, denominator, equivalent fraction, lowest common denominator, numerator, reciprocal, multiplier, percentage decrease, percentage increase, percentage gain, percentage loss, annual rate, principal, original amount, unitary method,

Weeks to go: **8**	Topic: **Pythagoras and Trigonometry**

Can you…		RAG	**Own notes:**
Calculate the length of the hypotenuse or short side in a right angled triangle? Solve problems using Pythagoras' theorem? Use Pythagoras' Theorem with Isosceles Triangles and in 3D problems? Use trigonometry to calculate angles using inverse functions? Find lengths of sides and angles in right angled triangles using sine, cosine and tangent functions? Decide which trigonometric ratio to use in right angled triangles? Solve problems using trigonometry? Use isosceles triangles in trig problems?			

Facts:	**Key Words:**
Pythagoras can only be used with right angled triangles. Length of the hypotenuse c is found using $c^2 = a^2 + b^2$ Isosceles triangles have a line of symmetry that divides them into two congruent right angled triangles. Sin θ = opposite ÷ hypotenuse Cos θ = adjacent ÷ hypotenuse Tan θ = opposite ÷ adjacent SOHCAHTOA	Pythagoras, Hypotenuse, trigonometry, tangent, cosine, sine, 3D, Isosceles Triangle, Adjacent side, opposite side, inverse functions, angle of depression, angle of elevation, bearing, three figure bearing.

Weeks to go: **7**	Topic: **Further Algebra**

Can you…		RAG	**Own notes:**
- change the subject of a formula - change the subject when on both sides - simplify algebraic fractions being added or subtracted - simplify algebraic fractions being multiplied or divided (link to factorising) - solve equations involving algebraic fractions - extend simple number sequences - find nth term of a linear sequence - find nth term of a quadratic sequence			

Facts:	**Key Words:**
Must always apply the same operation to both sides of an equation or formula When adding or subtracting ANY fraction (numerical or algebraic) must always find a common denominator "Term" = a number in a sequence In sequences n stands for the position of the term (eg. n=50 is the 50^{th} term) The common difference in a linear sequence is what you multiply n by	Cross multiply, balance, formula, equation, term, position, difference, second difference

Weeks to go: **6**	Topic: **Probability**

Can you…		RAG	**Own notes:**
- Understand the difference between theoretical and experimental probability and realise when an experiment is biased - Apply the fact that the sum of all probabilities equals 1 - Find the expectation of an event given an experimental result - Use two-way tables to find probabilities - Find the probability of two mutually exclusive events occurring - Find the probability of two combined events happening at the same time - Use tree diagrams to find probabilities - Use the AND and OR rules for finding probabilities - Use conditional probability			

Facts:	**Key Words:**
Probability = $\frac{\text{Number of "successes"}}{\text{Number of trial}}$ p(n) is the notation to denote "Probability of event 'n' happening" p(NOT n) = 1 – p(n) p(*A* OR B) = p(*A*) + p(B) p(Y AND Z) = p(Y) x p(Z) p(*at least* **one** instance) = 1 – p(NO instances) In tree diagrams, multiply along branches for "AND", add ends of branches for "OR"	Bias, experiment, trial, success, outcome, event, exhaustive, mutually exclusive, sample, sample space diagram, probability, tree diagram, expectation, complementary

Weeks to go: **5**	Topic: **Statistical Analysis**

Can you…

- find mean from a frequency table of discrete data
- find estimated mean from a grouped table of continuous data
- design questionnaires and surveys

- use a moving average to predict future values
- calculate number to be surveyed for a stratified sample
- find median and quartiles from cumulative frequency diagrams and histograms
- find the median, quartiles and the interquartile range from a histogram

RAG

Own notes:

Facts:

- range = highest value – lowest value
- mean is sum of all values divided by the number of values
- before working out the median (middle value), you need to put values in order
- mode represents the value that comes up the most
- when working out moving average, pay particular attention to how many points are being required
- Lower quartile is a quarter of the way through data values; upper quartile is three quarters of the way; median is two quarters (half) the way
- stratified sampling involves dividing the total sample size between sub groups based on what proportion they form of the total population – think in terms of fractions

Key Words:

Mean, measure of location, median, mode, frequency table, continuous data, discrete data, estimated mean, groups, modal group, data collection sheet, hypothesis, leading question, survey, bias, moving average, seasonal trend, trend line, population, random, sample, stratified, unbiased, class interval, interquartile range, lower quartile, upper quartile, cumulative frequency graph, histogram,

Weeks to go: **4**	Topic: **Further Trigonometry**

Can you…

Use trigonometric relationships to solve more complex 2D and 3D problems?

Find the sine, cosine and tangent of any angle from 0° to 360°

Find the sides and angles of any triangle whether it has a right angle or not using the sine rule

Find the sides and angles of any triangle using the cosine rule

Use sine, cosine and tangent of 30°, 45°, 60°

Work out the area of a triangle if you know two sides and the included angle

RAG

Own notes:

Facts:

SOHCAHTOA

Pythagoras' Theorem : $c^2 = a^2 + b^2$

Sine Rule:

$a \div \sin A = b \div \sin B = c \div \sin C$

Cosine Rule: $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle : $\frac{1}{2}ab\sin C$

$\sin 60 = \frac{\sqrt{3}}{2}$, $\cos 60 = \frac{1}{2}$, $\tan 60 = \sqrt{3}$

$\sin 30 = \frac{1}{2}$, $\cos 30 = \frac{\sqrt{3}}{2}$,

$\tan 30 = \frac{\sqrt{3}}{3} = \frac{1}{\sqrt{3}}$

$\sin 45 = \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}}$, $\cos 45 = \frac{\sqrt{2}}{2} = \frac{1}{\sqrt{2}}$,

$\tan 45 = 1$

Key Words:

Pythagoras' Theorem, Trigonometry, sine, cosine, tangent, area, length, perpendicular, included angle, cosine rule and sine rule.

Weeks to go: **3**	Topic: **Proportion and Ratio**

Can you…		RAG	**Own notes:**
- recognise the equivalence between ratio and fractions - compare ratios by converting to forms such as *1:n* or *n:1* - divide a quantity in a given ratio - calculate a ratio when only part of the information is given - solve a problem involving direct proportion - find what is the best product to buy - find formulae describing direct or inverse variation and use them to solve problems - solve direct and inverse variation problems involving three variables			

Facts:	**Key Words:**
- when solving problems relating to ratios, ensure you convert all quantities to same units - ratios are normally compared by converting them to one of these two forms *1:n* or *n:1* - when dividing a quantity in a given ratio, work out the total parts that the quantity needs to be split into - Unitary method involves working out the value of one unit - write out equation using constant of proportionality *k* before solving it - in general, you will need to work out the value of *k* before anything else - pay particular attention to whether the problem is to do with direct, inverse, square or cube proportion (or variation)	Common units, fractions, ratio, direct proportion, unitary method, best buy, constant of proportionality – *k*, direct proportion, direct variation, inverse proportion,

Weeks to go: 2	Topic: **Accuracy, Dimensions and Errors**

Can you…		RAG	**Own notes:**
-Find the upper and lower bounds of a rounded whole number -Find upper and lower bounds of a number rounded to significant figures or decimal places -Use upper and lower bounds to find limits on calculations -Work out whether a formula represents a length, area or a volume by looking at its dimensions			

Facts:	**Key Words:**
1 dimension = length 2 dimensions = area 3 dimensions = volume For the upper bound of a number use .5 rather than .4999999… Eg If a number is 7 to the nearest whole number then the upper bound is 7.5 (not 7.499999…) This makes further calculations easier	Continuous data, discrete data, limits of accuracy, lower bound, upper bound, rounding error, maximum, minimum, dimensions, length, perimeter, area, volume

Weeks to go: **1**	Topic: **Vectors**

Can you…		RAG	**Own notes:**
-Work out the length of a vector. -Add vectors -Express vectors in terms of **a** and **b** -Recognise when vectors are parallel -Use vectors to prove or solve geometrical problems			

Facts:	**Key Words:** Vector, scalar, magnitude, resultant, displacement, proof

Well done. You are now ready.
Good luck in your exam.