

Year 10

June Exams

Maths

Revision List

In this document you will find the topics you have covered over the last two years in Maths. This will be your first experience of completing a full set of three GCSE papers covering everything that is in the Edexcel Specification.

To help you with your revision you can use the Hegarty Maths website. We have linked the majority of topics to a video on Hegarty Maths. You can watch the video and answer some practice questions. Hopefully you will find that this is a really useful resource.

To access Hegarty Maths if you have not done before, please use the following steps:

1. Go to the website: www.hegartymaths.com
2. Click Student log in (top right corner the green box)
3. Type in Southam College for the school name
4. Enter your first name, last name and date of birth
5. You will then be asked to create a password and this will make you a log in that you can keep using.

If you have any issues or need any support with any of this please email: alcock.c@welearn365.com

"The only way to learn mathematics is to do mathematics"

-Paul Halmos

Good luck with your revision 😊

Higher: Chapter 1 - Number

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty Maths Lessons
List possible outcomes from two events.	Work out the total number of ways of performing a series of tasks (factorial)	670 Systematic Listing
Round numbers to a given number of significant figures	Estimate more complex calculations involving square roots etc.	130 Round to significant figures
Estimate basic calculations with +, -, X & /	Problem solving involving estimation	131 Estimate complex calculations
List the multiples and factors of a number.	Apply HCF and LCM to problem solving questions	31 Highest common factor (listing) 34 Lowest common multiple (listing)
Write a number as a product of its prime factors.	HCF and LCM word problems involving more than 2 numbers	29 Prime factorisation 1 30 Prime factorisation 2 & 36 LCM (worded problems)
Find the HCF and LCM of two numbers using Venn diagrams for larger numbers		32 Highest common factor (prime factorisation) 35 Lowest common multiple (prime factorisation)
Work out simple powers and roots.	Use negative indices.	101 Square & cube roots 104 Index form 3 (power of negative integers)
Use powers and roots in calculations.	Use fractional indices.	108 Index form 7 (powers of unit fractions) 109 Index form 8 (powers of non-unit fractions)
Multiply and divide using index laws.	Evaluating fractions with fractional, negative powers	105 Index form 4 (multiplying indices) 106 Index form 5 (dividing indices) 107 Index form 6 (power of power rule)
Know anything to the power of zero = 1.		103 Index form 2 (power of 0 & 1)
Write an ordinary number in standard form.	Adding and subtracting numbers in standard form: $7.2 \times 10^2 + 6.2 \times 10^{-1}$	122 Ordinary to standard form 127 Adding & subtracting with standard form
Write a number written in standard form as an ordinary number	$(7 \times 10^x) + (7 \times 10^y) + (7 \times 10^z) = 700\,070.07$ write possible values of x, y and z	123 Standard form to ordinary
Multiplying and dividing numbers in standard form	Word problems involving standard form	125 Multiplying with standard form 126 Dividing with standard form
Understand the difference between rational and irrational numbers.	Rationalise the denominator of a/\sqrt{b} Rationalise the denominator of $a/\sqrt{bx+c}$	118 Rationalising surds 1 119 Rationalising surds 2
Able to multiply and divide surds	Adding and subtracting fractions where the denominator needs to be rationalised first	115 Simplifying surds 113 Multiplication & division with surds 1 114 Multiplication & division with surds 2
	Write $3^{-1/2}$ as a surd and rationalise the denominator	

Higher: Chapter 2 - Algebra

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty Maths Lessons
Use the rules of indices to simplify algebraic expressions: eg. $6x^4 \div 3x^2$ $(2x^2y^3)^2$ $x^0 = 1$ $x^{(-m)} = 1/x^m$ $x^{(1/n)} = \sqrt[n]{x}$	Simplify $(4p^{-2}q^{-4})^{-1/2}$	174 Indices with algebraic expressions 2 175 Indices with algebraic expressions 3
Expanding single brackets e.g. $3(5x - 7)$ but also $4(2x + 5) - 5(3x - 7)$	Extend *Factorise completely $25(a+b)^2 - 35(a+b)$ *Show algebraically that product of any 2 consecutive integers is divisible by 2	160 Expand a single bracket 161 Expand two single brackets & simplify
Factorising algebraic expressions		168 Factorise simple expressions 1 169 Factorise simple expressions 2
Solving linear equations involving brackets and numerical fractions	Solving linear equations involving algebraic fractions	178 Solve 1-step equations 179/180/181/182 Solve 2-step equations 184 Solve equations with x on both sides 1 185 Solve equations with x on both sides 2 186 Solve equations with x on both sides 3
Use equations to solve problems	Setting up and solving more difficult equations	176 Forming equations
Substitute numbers into formulae	Substituting into formula involving standard form	278 Substitution into complex formulae
Rearrange formulae	Rearranging formulae where the subject appears twice	280 Change the subject of the formula 1 281 Change the subject of the formula 2 285 Change the subject of the formula 6
Distinguish between expressions, equations, formulae and identities		154 Expressions, equations, identities & formulae
Find the general formula for the nth term of an arithmetic sequence		198 Linear sequences (nth term)
Determine whether a particular number is a term of a given arithmetic sequence		
Solve problems using geometric sequences	Find the nth term of a quadratic sequence	248 Find the nth term of a quadratic sequence
Work out terms in Fibonacci-like sequences		263 Fibonacci sequence
Expand the product of two brackets	Expand the product of three brackets	162/163 Expand double brackets 166 Expand triple brackets
Factorise quadratics of the form: $x^2 + bx + c$	Factorise quadratics of the form $ax^2 + bx + c$	223 Factorise quadratic expressions 1 228 Factorise quadratic expressions 8
Use the difference of two squares	Problem solving involving factorising quadratics	224 Factorise quadratic expressions 2

Higher: Chapter 3 - Interpreting and representing data

Ability 5-9	Hegarty Maths Lessons
Problems involving M,M,M and R i.e. 20 females have a mean of 5.6 and 10 males have a mean of 11.4 what is the overall mean?	404 - Mode 405 - Mean (1) & 406 - Mean (2) 407 - Mean (3) & 408 - Mean (4) 409 - Median & 410 - Range
Construct and use back - to - back stem and leaf diagrams e.g. be able to compare the distributions of two stem and leaf diagrams (range and median)	430 - Stem and leaf (1) 431 - Stem and leaf (2) 432 - Stem and leaf (3) 433 - Stem and leaf (4)
Construct and use frequency polygons	441 - Frequency polygons
Construct and use pie charts	427 - Pie charts (1) & 428 - Pie charts (2) 429 - Pie charts (3)
Plot and interpret time series graphs	450 - Time series charts (1) 451 - Time series charts (2)
Use trends to predict what might happen in future	452 - Time series charts (3)
Plot and interpret scatter graphs	453 - Scatter diagrams (1)
Determine whether or not there is a linear relationship between two variables	454 - Scatter diagrams (2)
Draw a line of best fit on a scatter graph	454 - Scatter diagrams (2)
Use the line of best fit to predict values	454 - Scatter diagrams (2)
Decide which average is best for a set of data	419 - Averages and range (problem solving)(1) 420 - Averages and range (problem solving)(2) 421 - Averages and range (problem solving)(3)
Estimate the mean and range from a grouped frequency table	417 - Mean from frequency table (1) 418 - Mean from frequency table (2) 414 - Range from frequency table
Find the modal class and the group containing the median	415 - Mode from frequency table 416 - Median from frequency table
Construct and use two-way tables	422 - Two-way tables (1) 423 - Two-way tables (2) 424 - Two-way tables (3)
Choose appropriate diagrams to display data	
Recognise misleading graphs	

Higher: Chapter 4 - Fractions, ratio and percentages

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty Maths Lessons
Find the reciprocal of an integer, decimal or fraction		71 - Reciprocal of fractions
Add, subtract, multiply and divide fractions and mixed numbers		65 - Add or subtract fractions (same denominator) 66 - Add or subtract fractions (different denominator) 68 - Multiplying fractions1 & 69 - Multiplying fractions2 70 - Dividing fractions 72 - Linking multiplying/dividing fractions & whole numbers
Write ratios in the form 1:n or n:1 e.g. £3:60p, 2hours:45 mins, 3/4:9/10 (also word problems)	Changing ratios: The ratio of male to female pupils going on a skiing trip is 5:3. Four male teachers and nine female teachers are also going on the trip. The ratio of males to females going on the trip is 4:3 (including teachers). How many females are going on the trip?	331 - Write ratios in the form 1:n or n:1
Compare ratios e.g. which squash drink would be stronger		328 - Compare quantities using ratio
Find quantities using ratios e.g. ratio of boys to girls is 3:4. There are 33 boys, how many girls are there?		335 - Harder problems involving ratios 1 336 - Harder problems involving ratios 2 337 - Harder problems involving ratios 3
Share in a ratio (including 3 way ratios)		332 - Share in a given ratio (1) 333 - Share in a given ratio (2) 334 - Share in a given ratio (3)
Convert between currencies and measures		707 - Converting currency (1) 708 - Converting currency (2)
Recognise and use direct proportion (recipes and just simple direct proportion formally as it comes up later)		739 - Recipe problems (1) & 740 - Recipe problems (2) 741 - Recipe problems (3) 742 - Recipe problems (4)
Solve problems involving ratios and proportion		330 - Write ratios as fractions/proportions
Work out percentage increases and decreases		90 - Percentage increase or decrease
Simple interest and compound interest		89 - Percentage/decimal multipliers 93 - Simple interest & 94 - Compound interest
Percentage change and percentage loss (or profit)		97 - Percentage change
Reverse percentages (finding the original amount)		96 - reverse percentage
Calculating using fractions, decimals and percentages e.g. word problems that involve F,D, P and R		149 - Conversions between FDP (summary)
Writing terminating decimals as a fraction	Writing fractions to recurring decimals	52 - Convert simple decimals to fractions
Writing basic recurring decimals formally as a fraction e.g. 0.33333....	Writing trickier recurring decimals as a fraction e.g. 0.166666666..., 0.234234234234..., 8/33	53 - Convert recurring decimals to fractions 1 54 - Convert recurring decimals to fractions 2

Higher: Chapter 5 - Angles and trigonometry

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty maths
Angles in parallel lines		481 - Alternate angles & 482 - Co-interior angles 483 - Corresponding angles
Knowing and understanding properties of triangles and quadrilaterals		484 - Proof-angles in a triangle 560 - Interior angles in quadrilaterals
Derive and use the sum of angles in a triangle and in a quadrilateral. Problems involving angles with triangles, parallel lines and quadrilaterals mixed together.		485 - Angles in a triangle (1) 486 - Angles in a triangle (2) 487 - Angles in a triangle (3) 488 - Multi-step angle problems (1) 489 - Multi-step angle problems (2) 490 - Multi-step angle problems (3) 491 - Multi-step angle problems (4)
Calculate the sum of the interior angles of a polygon		561 - Interior angles in polygons (1)
Use the interior angles of a polygon to solve problems		562 - Interior angles in polygons (2)
Know the sum of the exterior angles of a polygon		563 - Exterior angles in polygons (1)
Use the angles of polygons to solve problems		564 - Exterior angles in polygons (2) 565 - Angles in polygons using algebra
Calculate the length of the hypotenuse in a right-angled triangle		498 - Pythagoras (longer side)
Calculate the length of the shorter side in a right-angled triangle		499 - Pythagoras (shorter side)
Solve problems using Pythagoras' theorem e.g. Using Pythagoras twice e.g. A ship sails 5 miles North and then 8.1m East. It then returns directly to its starting point. What is the total distance the ship travels.		501 - Pythagoras (applied)(1) 502 - Pythagoras (applied)(2) 503 - Pythagoras (multi-step)(1) 501 - Pythagoras (multi-step)(2)
Able to label hypotenuse, opposite and adjacent		508 - Trigonometry introduction
Understand the trigonometric ratios (SOH CAH TOA)		
Use trigonometric ratios to find lengths in a right-angled triangle		509 - Trigonometry (find side)(1) 510 - Trigonometry (find side)(2)
Use trigonometry ratios to calculate an angle in a right-angled triangle	Know the exact values of the sine, cosine and tangent of some angles	511 - Trigonometry (find angle)(1) 512 - Trigonometry (find angle)(2) 845 - non-calculator trigonometry (1)
Find angles of elevation and angles of depression		515 - Trigonometry (elevation/depression)
Use trigonometry ratios to solve problems		514 - Trigonometry (multi-step)(1) 515 - Trigonometry (multi-step)(2)

Higher: Chapter 6 - Graphs

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty maths
Find the gradient and y-intercept from a linear equation		206 - Straight line graphs 1, 207 - Straight line graphs 2
Rearrange an equation into the form $y = mx + c$		210 - Straight line graphs 5
Find the equation of the line by looking at the graph Sketch the graphs using the gradient and intercepts		208 - Straight line graphs 3 209 - Straight line graphs 4
Find the equation of a line, given its gradient and one point on the line.		211 - Straight line graphs 6 212- Straight line graphs 7
Find the gradient of a line through two points.		213 - Straight line graphs 8
Understand whether or not a point lies on a line		
Understand whether or not two lines are parallel		214 - Straight line graphs (parallel)
Draw and interpret distance-time graphs.		874 - Distance-time graphs (1), 875 - Distance-time graphs (2) 876 - Distance-time graphs (3)
Calculate average speed from a distance-time graph		877 - Distance-time graphs (4), 878 - Distance-time graphs (5) 879 - Distance-time graphs (6)
Understand velocity-time graphs		880 - Speed-time graphs (1)
Find acceleration and distance from velocity-time graphs		881 - Speed-time graphs (2), 882 - Speed-time graphs (3) 883 - Speed-time graphs (4), 884 - Speed-time graphs (5) 885 - Speed-time graphs (6), 886 - Speed-time graphs (7)
Draw/interpret real-life graphs & recognise direct proportion		894 - Interpreting real-life graphs, 895 - Drawing real - life graphs
Draw and use a line of best fit		454 - Scatter diagrams (2)
Find the coordinates of the midpoint of a line segment	Find the equations of lines perpendicular to a given line	200 - Midpoint of a line segment
Find the gradient and length of a line segment		201 - Gradient of a line segment 1, 202 - Gradient of a line segment 2 203 - Gradient of a line segment 3 (fractions) 215 & 216 - Straight line graphs (perpendicular) 1 & 2
Find the equations of lines parallel to a given line		214 - Straight line graphs (parallel)
Draw quadratic graphs (make sure use brackets for negative values of x)		252 - Drawing quadratic graphs from a table
Solve quadratic equations using graphs		253 - Finding the x-intercept (roots) of a quadratic graph
Identify the line of symmetry of a quadratic graph		254 - Find the line of symmetry of a quadratic graph
Interpret quadratic graphs relating to real-life situations		
Draw graphs of cubic functions & solve cubic equations		298 - Cubic graphs (from a table of values)
Draw graphs of reciprocal functions (understand reciprocals)		300 - Reciprocal graphs 1
Recognise a graph from its shape		348 - Graphs & algebraic proportion
Interpret linear and non-linear real-life graphs	Draw the graph of a circle	894 - Interpreting real-life graphs 314 - Equation of a circle 1 (just the start)

Higher: Chapter 7 - Area and volume

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty maths
Find the area and perimeter of different 2D shapes (triangles, rectangles, parallelograms etc.)		549 - Perimeter 2 & 550 - Perimeter 3 551 - Perimeter 4
Find the area and perimeter of compound shapes/ shaded area		555 - Compound shapes
Find the area of a trapezium (also try working backwards if you are given the area and need to find a length)		559 - Trapezium
Convert between metric units of area	Calculations using upper and lower bounds	700 & 701 - Converting area units (1) & (2)
Calculate upper and lower bounds		137 - Upper and lower bounds 1 138 - Upper and lower bounds 2 (worded) 139 - Upper and lower bounds 3 (calculations)
Calculate volumes of given prisms	Calculations with upper/lower bounds for volume	570 - Prisms (1) & 571 - Prisms (2)
Calculate surface area of given prisms		585 - Surface of prisms
Convert between metric units of volume		702 & 703 - Converting volume units (1) & (2) 704 - Converting volume and capacity (3)
Calculate the circumference and area of a circle		534 - Circumference of a circle (1) 537 & 538 - Circumference of a circle (4) & (5) 539 - Area of a circle (1) 542 & 543 - Area of a circle (4) & (5)
Calculate the circumference and area of a circle in terms of π		Covered in the sections above
Problem solving with circles when given the area and need to work out the radius etc.		535 - Circumference of a circle (2) 540 - Area of a circle (2)
Calculate the perimeter and area of semicircles and quarter circles	Calculate the angle when given the arc length or area of sector	536 - Circumference of a circle (3) 541 - Area of a circle (3)
Calculate arc lengths and areas of sectors of circles		544 & 545 - Arc length (1) & (2) 546 & 547 - Area of sector (1) & (2)
Calculate the volume and surface area of a cylinder	Problem solving e.g. a cylinder of length 8cm and radius 3cm is melted down and made into a sphere. What is the radius of the sphere	572, 573 & 574 - Cylinders (1), (2) & (3) 586 - Surface area of cylinders
Calculate the volume and surface area of a sphere (could include surface area of a hemisphere)		580 - Spheres (1) & 581 - Spheres (2) 588 - Surface area of spheres
Calculate the volume and surface area of a pyramid		579 - Rectangular based pyramids
Calculate the volume and surface area of a cone		576 - Cones (1) & 577 - Cones (2) 587 - Surface area of cone
Calculate the volume of a frustum		578 - Frustums
Calculate the volume of compound 3D shapes		582 - Compound volume

Higher: Chapter 8 - Transformations and constructions

Ability 5-6	Hegarty maths
Draw plans and elevations of 3D solids	838, 839, 840, 841, 842, 843, 844 & 845 - Plans and elevation (1), (2), (3), (4), (5), (6), (7) & (8)
Reflect 2D shapes in a given mirror line	639, 640 & 641 - Reflections (1), (2) & (3)
Describe given reflections	652 - Describe transformations (3)
Rotate a 2D shape about a centre of rotation	648 - Rotations (1) & 649 - Rotations (2)
Describe given rotations	653 & 654 - Describe transformations (4) & (5)
Enlarge shapes by a positive integer scale factor about a centre of enlargement	642 - Enlargements (1) & 643 - Enlargements (2)
Enlarge shapes by a negative scale factor about a centre of enlargement	646 - Enlargements (5)
Enlarge shapes by a fractional scale factor about a centre of enlargement	644 - Enlargements (3) & 645 - Enlargements (4)
Describe given enlargements (make sure they can also work out the centre of enlargement)	652- Describe transformations (2)
Translate a shape using a vector	638 - Translations (2)
Describe translations (also understand resultant vector)	650- Describe transformations (1)
Carry out and describe combinations of transformations	656 - Combined transformations (1) 657 - Combined transformations (2)
Draw and use scales on maps and scale drawings	870 - Scale diagrams (problem solving 1) 871 - Scale diagrams (problem solving 2)
Solve problems involving bearings	492, 493, 494, 495 & 496 - Bearings (1), (2), (3), (4) & (5)
Construct triangles using a ruler and compasses	683 - Constructing triangles
Construct the perpendicular bisector of a line	660 - Construct a perpendicular bisector
Construct the shortest distance from a point to a line using a ruler and compasses	662 - Construct a perpendicular from a point to a line
Bisect an angle using a ruler and compasses	661 - Construct an angle bisector
Construct angles using a ruler and compasses	664 - Construct a 90° and 45° angle 665 - Construct a 30°, 60° and 120° angle
Construct shapes made from triangles using a ruler and compasses	666 - Construct equilateral triangle
Draw a locus	674 - Loci (1)
1. Locus of points which are a fixed distance from a given point	675 - Loci (2)
2. Locus of points which are a fixed distance from a given line	676 - Loci (3)
3. The locus of points which are equidistant from 2 given lines	677 - Loci (4)
4. The locus of points which are equidistant from 2 given points	678 - Loci (5)
Use loci to solve problems	679 - Loci (problem solving)

Higher: Chapter 9 - Equations and inequalities

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty maths
Solve a quadratic equation by factorising (don't forget the difference of 2 squares)	Find the roots of a quadratic function by factorising when 'a' is not 1	230 - Solving quadratic equations 1 (by factorising) 231 - Solving quadratic equations 2 (by factorising) 232 - Solving quadratic equations 3 (by factorising)
Rearrange and solve simple quadratic equations	Solve a quadratic equation by using the quadratic formula	233 - Solving quadratic equations 4 (by factorising) 241 - Solving using the quadratic formula 1 242 - Solving using the quadratic formula 2
Solving linear simultaneous equations	Solve a quadratic equation by completing the square	190 - Simultaneous equations by elimination 1 (intro) 191 - Simultaneous equations by elimination 2 192 - Simultaneous equations by elimination 3 193 - Simultaneous equations by elimination 4 238 - Solving by completing the square 1 239 - Solving by completing the square 2
Solve simultaneous equations for real-life situations	Solve simultaneous equations with one quadratic	195 - Simultaneous equations (in context) 246 - Simultaneous equations involving quadratics
Solve inequalities and show the solution on a number line and using set notation (remember brackets and fractions)	Use real-life situations to construct quadratic and linear equations and solve them	269 - Solving single linear inequalities 1 (positive x) 270 - Solving single linear inequalities 2 (negative x) 271 - Solving single linear inequalities 3 (difficult)

Higher: Chapter 10 - Probability

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty maths lesson
Use the product rule for finding the number of outcomes for two or more events		671 - Product rule for counting (1) 672 - Product rule for counting (2) 673 - Product rule for counting (3)
List all the possible outcomes of two events in a sample space diagram and find probabilities from it		670 - Systematic listing 358 - Probability of more than one event (1) 359 - Probability of more than one event (2)
Identify mutually exclusive outcomes and events		354 - mutually exclusive events
Find the probabilities of mutually exclusive events		354 - Mutually exclusive events
Find the probability of an event not happening		353 - Probability of event not happening
Work out the expected results for experimental and theoretical probabilities i.e. The probability of landing on blue is $\frac{1}{3}$. The spinner is spun 150 times, how many times would you expect to land on blue?		
Compare real results with theoretical expected values to decide if a game is fair		356 - Experimental probability and relative frequency
Draw and use frequency trees		368 - Frequency trees (1) 369 - Frequency trees (2)
Understand the meaning of independent events and how to find the probability of two independent events	Decide if 2 events are independent	360 - Independent events
Draw and use probability tree diagrams (Be careful with at least one questions)	Draw and use tree diagrams to calculate conditional probability	361 - Independent events & probability trees (1) 362 - Independent events & probability trees (2) 363 - Independent events (simplified probability trees) 364 - Conditional probability (1) 365 - Conditional probability (2) 366 - Conditional probability (3) 367 - Conditional probability (4)
Showing sets on a Venn diagram i.e. understanding curly brackets, the universal set, unions, intersections, complements	Draw and use tree diagrams without replacement	307 - Listing elements in a set (1) 308 - Listing elements in a set (2)
Finding basic probabilities from Venn diagrams	Use Venn diagrams to calculate conditional probability	383, 384, 385, 386, 387 & 388 - Venn diagrams for probability (1), (2), (3), (4), (5) & (6)
Use set notation	Probabilities of multiple intersections and unions	

Higher: Chapter 11 - Multiplicative reasoning

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty maths
Find an amount after a repeated percentage change i.e. in the first year it decrease by 7% then the next 3 years it decreases by 5%		91 - Repeated percentage increase or decrease (1) 92 - Repeated percentage increase or decrease (2)
Calculate compound interest		94 - Compound interest
Solve growth and decay problems		804, 805, 806 & 807 - Real life exponential growth (1), (2), (3) & (4) 808, 809, 810 * 811 - Real life exponential decay (1), (2), (3) & (4)
Calculate rates i.e. wages earnt or rate of petrol use		755 & 756 - Income and rates of pay (1) & (2)
Convert between metric speed measures		724 - Speed 9
Calculate speed/distance/ time	Substituting into kinematic equations (SUVAT)	716, 717, 718, 719, 720, 721, 722 & 723 - Speed 1, 2, 3, 4, 5, 6, 7 & 8. 788 - Substitution (equations of motion 1) 789 - Substitution (equations of motion 2)
Calculate density/ mass/ volume		725, 726, 727, 728, 729, 730 & 731 - Density (1), (2), (3), (4), (5), (6) & (7) 732 - Density (problem solving 1) 733 - Density (problem solving 2)
Calculate pressure/ force/ area		734 - Pressure (1) 735 - Pressure (2) 736 - Pressure (3) 737 - Pressure (4)
Understanding the link of a proportional equation and it's graph i.e. $y=kx$ where k is the gradient	Recognise types of proportion graphs i.e. $y= kx^2$, $y= k/x$, $y=k/x^2$	339, 340 & 341 - Direct proportion 1, 2 & 3 342 - Inverse proportion 348 - Graphs and algebraic proportion
Use direct and inverse proportion i.e. writing formulas for a particular real life scenario like men digging a hole or petrol use		343 - Algebraic direct proportion 1 344 - Algebraic direct proportion 2 345 - Algebraic direct proportion 3 346 - Algebraic inverse proportion 1 347 - Algebraic inverse proportion 2

Higher: Chapter 12 - Similarity and congruency

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty maths
Show that two triangles are congruent and know the conditions of congruence	Proving congruency when circle theorems and parallel lines are involved	682 - Congruent triangles
Proving triangles are congruent (SSS, AAS, SAS, RHS)		682 - Congruent triangles
Solve problems involving congruency		684 - Congruent triangle (problem solving 1) 685 - Congruent triangle (problem solving 2) 686 - Congruent triangle (problem solving 3) 687 - Congruent triangle (problem solving 4) 688 - Congruent triangle (problem solving 5) 689 - Congruent triangle (problem solving 6) 690 - Congruent triangle (problem solving 7)
Use the ratio of corresponding sides to work out scale factors	Use the link between linear scale factor and area scale factor to solve problems	609 - Similar polygons (2) 615 - Area of similar shapes (1) 616 - Area of similar shapes (2) 617 - Area of similar shapes (3)
Find missing lengths on similar shapes	Use the link between linear scale factor, area scale factor and volume scale factor to solve problems	611 - Similar triangles (1) 612 - Similar triangles (2) 613 - Similar triangles (3) 618 - Volume of similar shapes (1) 619 - Volume of similar shapes (2) 620 - Volume of similar shapes (3) 621 - Volume of similar shapes (4)
Use similar triangles to work out lengths in real life		614 - Similar shapes (problem solving)

Higher: Chapter 13 - More trigonometry

Ability 7-9	Hegarty maths lesson
Understand and use upper and lower bounds in calculations involving trigonometry	137 upper and lower bounds 1 139 upper and lower bounds 3 (calculations)
Know the graph of the sine function	303 sine graph
Use the sine graph to solve equations e.g. solve $5 \sin x = 3$ for values of x between $0 < x < 540$	303 sine graph
Find exact values of $\sin 0, \sin 30, \sin 45, \sin 60, \sin 90$	845 Non calculator trigonometry
Know the graph of the cosine function	304 cosine graph
Use the cosine graph to solve equations e.g. solve $5 \cos x = 3$ for values of x between $0 < x < 540$	304 cosine graph
Find exact values of $\cos 0, \cos 30, \cos 45, \cos 60, \cos 90$	845 Non calculator trigonometry
Know the graph of the tangent function	305 tangent graph
Use the tangent graph to solve equations e.g. solve $3 \tan x = 11$ for values of x between $0 < x < 540$	305 tangent graph
Find exact values of $\tan 0, \tan 30, \tan 45, \tan 60, \tan 90$	845 Non calculator trigonometry
Find the area of a triangle using $A = \frac{1}{2}ab \sin C$	517 area of a triangle ($\frac{1}{2}ab \sin C$) 1 518 area of a triangle ($\frac{1}{2}ab \sin C$) 2 519 area of a triangle ($\frac{1}{2}ab \sin C$) 3
Use the sine rule to solve 2D problems (sides and angles)	521 & 522 sine rule (find length) 1 & 2 523 & 524 sine rule (find angle) 1 & 2
Use the cosine rule to solve 2D problems (sides and angles)	527 Cosine rule (find side) 1 528 Cosine rule (find side) 2 529 Cosine rule (find angle) 1 529 Cosine rule (find angle) 2
Solve bearings problems using trigonometry	531 Bearings (sine and cosine rule)
Use Pythagoras' theorem in 3D	505, 506 & 507 3D Pythagoras 1, 2 & 3
Use trigonometry in 3D	854 - 863: 3D trigonometry 1 - 10
Understand the transformation of $y = -f(x)$	311 - graph transformations 5
Understand the transformation of $y = f(-x)$	312 Graph transformations 6
Understand the transformation of $y = -f(-x)$	
Understand the transformation of $y = f(x) + a$	307 Graph transformations 1
Understand the transformation of $y = f(x + a)$	308 Graph transformations 2
Understand the transformation of $y = af(x)$	309 Graph transformations 3
Understand the transformation of $y = f(ax)$	310 Graph transformations 4

Higher: Chapter 14 - Further statistics

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty Maths Lesson
Understand key words i.e. population, census, sample, bias		394 Census, Sampling and Bias
Understand how to take a simple random sample		395 Random Sampling
Understand how to take a stratified sample		396 Stratified random sampling 1 397 Stratified random sampling 2
Identify problems with sampling methods		
Understand and use the capture- recapture method		872 Capture recapture 1 873 Capture recapture 2
Draw and interpret cumulative frequency tables and diagrams		437 Cumulative frequency diagrams 1
Work out the median, quartiles and interquartile range from a cumulative frequency diagram		438 Cumulative frequency diagrams 2 439 Cumulative frequency diagrams 3
Find the quartiles and the interquartile range from stem-and-leaf diagrams	Understand frequency density	430 Stem and leaf diagrams 1 432 Stem and leaf diagrams 3
Draw and interpret box plots	Draw histograms	446 Histograms 5 447 Histograms 6 434 Box plots 1 435 Box plots 2 436 Box plots 3
Compare two sets of data (compare a measure of averages and a measure of spread)	Interpret histograms	442 Histograms 1 443 Histograms 2 444 Histograms 3 445 Histograms 4 449 Histograms 8

Higher: Chapter 15 - Equations and graphs

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty maths lesson
Solve simultaneous equations graphically (linear)	Solve simultaneous equations graphically trickier ones (one linear, one quadratic or a circle)	218 Solve simultaneous equations using straight lines 1 219 Solve simultaneous equations using straight lines 2 259 Simultaneous equations using graphs (quadratic and linear)
Represent inequalities on graphs i.e $y < 3$, $x > 5$, $y < 2x + 7$ (dotted and solid lines)		273 Linear inequalities as graph regions 1 274 Linear inequalities as graph regions 2 275 Linear inequalities as graph regions 3
Interpret graphs of inequalities		276 Linear inequalities as graph regions 4
Recognise and draw quadratic functions (using a table of values)	Work out the turning points (completing the square), roots, where it crosses the y-axis	251 Drawing quadratic graphs from a table 255 Find the turning point of quadratic graphs 1 256 Find the turning point of quadratic graphs 2 252 Find the y intercept of a quadratic graph 253 Find the x intercept (roots) of a quadratic graph
	Find approximate solutions to quadratic equations graphically	260 using a quadratic graph to solve a related quadratic equation
	Matching quadratic graphs with given equations	
	Completing the square to decide if quadratic equations have 1, 2, or no roots	
	Solve quadratic equations using an iterative process	322 iteration
Sketch cubic functions using a table of values	Find roots of cubic functions	298 Cubic graphs (from a table of values)
Match equations to a given graph	Solve cubic equations using an iterative process	299 cubic equations (recognising) 322 iteration

Higher: Chapter 16 - Circle theorems

Ability 7-9	Hegarty maths
Solve problems involving angles, triangles and circles	
Understand and use facts about chords and their distance from the centre of a circle	593 - Isosceles triangles in circles
Solve problems involving chords and radii	593 - Isosceles triangles in circles
Understand and use facts about tangents at a point and from a point	599 - Circle theorems (6)
Give reasons from angle and length calculations involving tangents	600 - Circle theorems (7)
Understand, prove and use facts about angles subtended at the centre and the circumference of circles.	594 - Circle theorems (1)
Understand, prove and use facts about the angle in a semicircle being at a right angle	595 - Circle theorems (2)
Find missing angles using these theorems and give reasons for answers	
Understand, prove and use facts about angles subtended at the circumference of a circle	596 - Circle theorems (3)
Understand, prove and use facts about cyclic quadrilaterals	597 - Circle theorems (4)
Prove the alternate segment theorem	598 - Circle theorems (5)
Solve angle problems using circle theorems	603 - Circle theorems (using algebra)
Give reasons for angle sizes using mathematical language	604 - Circle theorems (multi-step) (1) 605 - Circle theorems (multi-step) (2) 606 - Circle theorems (multi-step) (3)
Find the equations of the tangent to a circle at a given point	320 - Circles, tangents and normals

Higher: Chapter 17 - More algebra

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty maths
Change the subject of a formula where the power of the subject appears		284 - Change the subject of a formula 5 (x with powers)
Change the subject of a formula where the subject appears twice		285 - Change the subject of a formula 6 (x on both sides)
Add and subtract basic algebraic fractions (x/3 + x/5)	Change the subject of a formula involving fractions where all the variables are in the denominators	172 - expressions with algebraic fractions 286 - Change the subject of a formula 7 (x on both sides/denominator)
Multiply and divide basic algebraic fractions		172 - expressions with algebraic fractions
Simplify simple algebraic fractions	Simplify more complicated algebraic fractions (involving factorising multiple quadratics before cancelling down)	170 - Simplifying expressions by factorising 1 171 - Simplifying expressions by factorising 2 229 - Simplifying algebraic fractions (involving quadratics)
	Add and subtract more complex algebraic fractions	
	Multiply and divide more complex algebraic fractions	
	Simplify expressions involving surds	115 - Simplifying surds
	Expand expressions involving surds	116 - Brackets involving surds 1 117 - Brackets involving surds 2
	Rationalise the denominator of a surds	118 - Rationalising surds 1 119 - Rationalising surds 2
	Solve equations that involve algebraic fractions	187 - Solving equations with algebraic fractions
Use and evaluate functions i.e. f(3)	Find composite functions	288 - Function notation 1 293 & 294 - Composite functions 1 & 2
	Find inverse functions	295 & 296 - Inverse functions 1 & 2
Prove a result using algebra Grade 4 example: Give a counter-example Grade 5 example: Prove $(n + 3)^2 - (n - 2)^2 = 5(2n+1)$ Grade 6 example: Prove that the sum of any three odd numbers is odd	Prove a result using algebra Grade 8 example: Show that the difference between 10^{10} and 6^{21} is a multiple of 2	325 - Direct algebraic proof 1 326 - Direct algebraic proof 2 327 - Direct algebraic proof 3 (quadratic)

Higher: Chapter 18 - Vectors and geometric proof

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty maths videos
Understand and use vector notation		622 - Vectors (1) - vectors and scalars 623 - Vectors (2) - column vectors 624 - Vectors (3) - negative vectors 622 - Vectors (1) - vectors and scalars
Work out the magnitude of a vector		627 - Vectors (6) - magnitude of a vector
Multiplying a vector by a scalar		626 - Vectors (5) - multiplying by a scalar
Adding and subtracting vectors		625 - Vectors (4) - combining vectors
Calculate using vectors and represent the solutions graphically		
Calculate the resultant of two vectors		
Solve problems using vectors		
Use the resultant of two vectors to solve vector problems		628 - Vectors - geometry problems (1) 629 - Vectors - geometry problems (2) 630 - Vectors - geometry problems (3) 631 - Vectors - geometry problems (4)
Express points as position vectors	Prove lines are parallel	632 - Vectors - geometry problems (5) 633 - Vectors - geometry problems (6)
	Prove points are collinear	634 - Vectors - geometry problems (7)
	Solve geometric problems in two dimensions using vector methods	635 - Vectors - geometry problems (8) 636 - Vectors - geometry problems (9)
	Apply vector methods for simple geometric proofs	

Higher: Chapter 19 - Proportion and graphs

Ability 5- 6	Ability 7-9 (+ all 5-6)	Hegarty maths videos
Write and use equations to solve problems involving direct proportion (only basic directly proportion)	Write and use equations to solve problems involving direct proportion (include squares, square roots, cubic)	343 - Algebraic direct proportion 1 344 - Algebraic direct proportion 2 345 - Algebraic direct proportion 3
	Write and use equations to solve problems involving indirect proportion (include squares, square roots, cubic)	346 - Algebraic inverse proportion 1 347 - Algebraic inverse proportion 2
	Recognise graphs of exponential functions	302 - Exponential graph
	Sketch graphs of exponential functions	
	Calculate the gradient of a tangent at a point	889 - Gradient at a point on a curve
	Estimate the area under a non-linear graph	891 - Area under a curve (1)