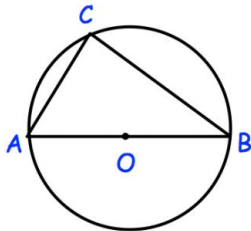
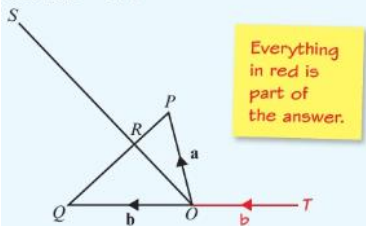
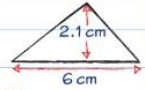
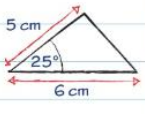
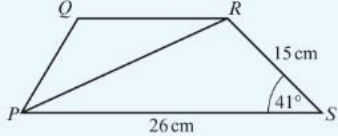
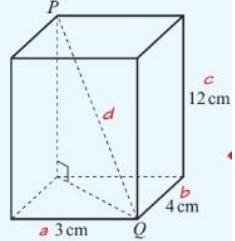
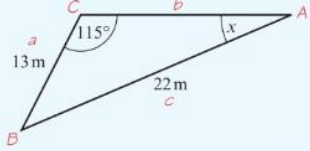
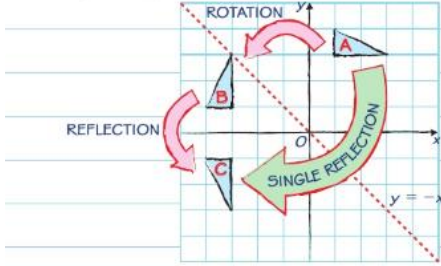
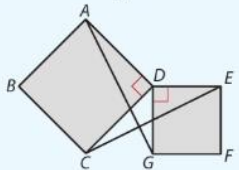
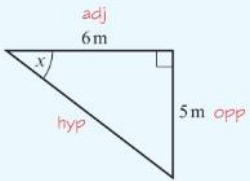
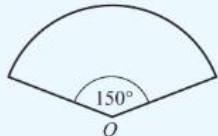
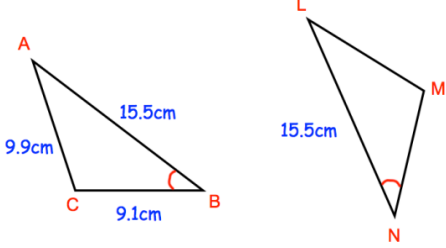
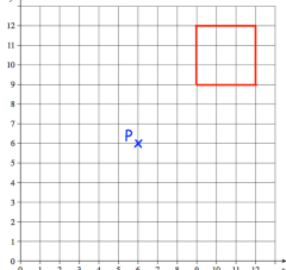
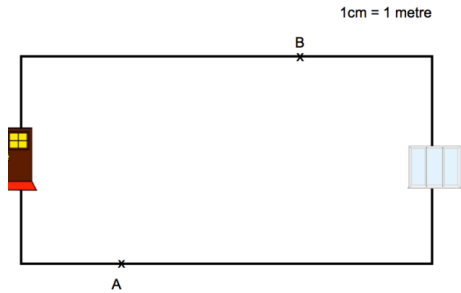
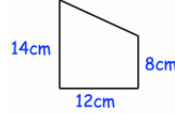


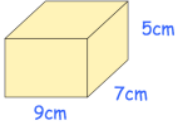
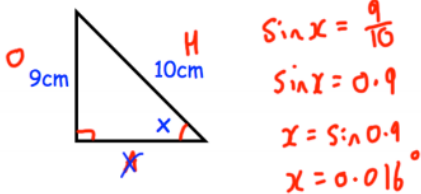
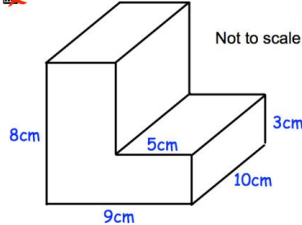
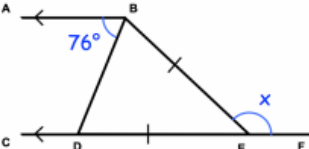
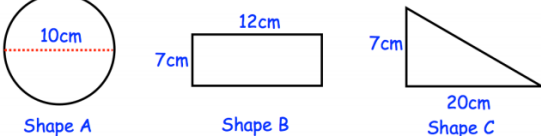
GCSE 9-1 Higher Revision Checklist

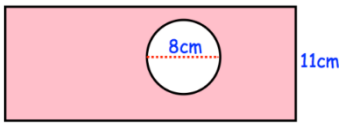
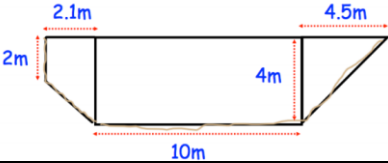
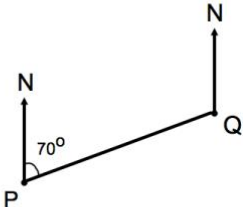

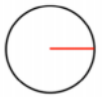

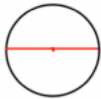






GEOMETRY & MEASURES

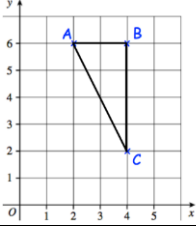
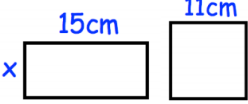
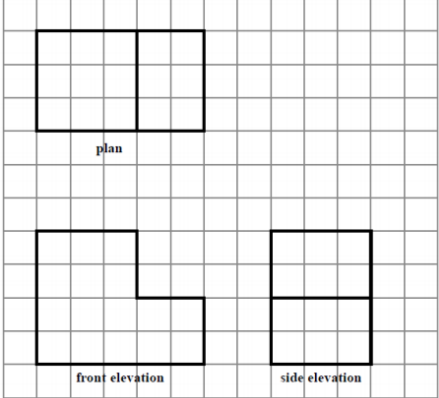
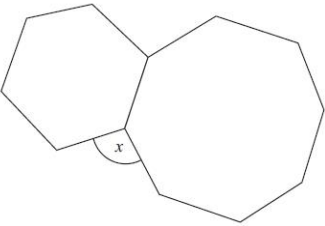
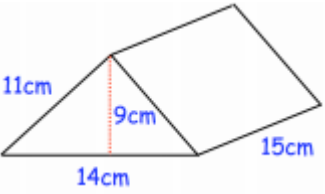
Title	Grade	What it looks like	I can do this
Circle theorems	8	<ul style="list-style-type: none"> Find missing angles using circle theorem and basic angle facts Use accurate language to reason using circle theorems and angle facts <p>A circle with centre O, has points A, B and C on the circumference. Angle $ABC = 20^\circ$</p>  <p>Find the size of angle BAC.</p>	
Vector arguments and proof	8	<ul style="list-style-type: none"> I can find a vector I can identify parallel vectors I can use these to prove statements based on a vector labelled diagram <p>In the diagram, OPQ is a triangle. Point R lies on the line PQ such that $PR:RQ = 1:2$. Point S lies on the line through OR such that $OR:OS = 1:3$</p>  <p style="background-color: yellow; border: 1px solid black; padding: 2px; display: inline-block;">Everything in red is part of the answer.</p> <p>(a) Show that $\vec{OS} = 2\mathbf{a} + \mathbf{b}$ (3 marks)</p>	
Area of a triangle	7	<ul style="list-style-type: none"> Know and use $A = \frac{1}{2}ab \sin C$ for any triangle <div style="border: 1px solid black; padding: 5px;"> <p>Which formula?</p> <p>If you know the base and the vertical height:</p>  <p>Area = $\frac{1}{2} \times \text{Base} \times \text{Vertical height}$ $= \frac{1}{2} \times 6 \times 2.1$ $= 6.3 \text{ cm}^2$</p> <p>If you know two sides and the included angle:</p>  <p>Area = $\frac{1}{2} ab \sin C$ $= \frac{1}{2} \times 5 \times 6 \times \sin 25^\circ$ $= 6.3 \dots \text{ cm}^2$</p> </div>	
Cosine Rule	7	<ul style="list-style-type: none"> Know that 3 sides can be used to find an angle using $\cos A = \frac{b^2+c^2-a^2}{2bc}$ for any triangle Know that 2 sides and the angle between can be used to find a side using (for any triangle) $a^2 = b^2 + c^2 - 2bc \cos A$ <p>$PQRS$ is a trapezium. Work out the length of the diagonal PR. (3 marks)</p> 	

<p>Pythagoras and trig 2D and 3D</p>	<p>7</p>	<ul style="list-style-type: none"> • Know and use SOHCAHTOA • Know and use Pythagoras • Know these only apply to right angled triangles 	<p>The diagram shows a cuboid. Work out the length of PQ. (3 marks)</p> 
<p>Sine Rule</p>	<p>7</p>	<ul style="list-style-type: none"> • Know and use either version of the sine rule • Angles: $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ • Sides: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ 	<p>Calculate the size of angle x. (3 marks)</p> 
<p>Combined transformations</p>	<p>6</p>	<ul style="list-style-type: none"> • Carry out or describe enlargements • Carry out or describe rotations • Carry out or describe translations • Carry out or describe reflections 	 <p>A to B to C: A rotation 90° anti-clockwise about O followed by a reflection in the x-axis is the same as a single reflection in the line $y = -x$.</p>
<p>Congruence and Similarity</p>	<p>6</p>	<ul style="list-style-type: none"> • Know the acceptable ways to identify congruence <ul style="list-style-type: none"> ○ Three sides SSS ○ Two angles & corresponding side AAS ○ Two sides & angle between SAS ○ Right angle, hypotenuse & side RHS 	<p>$ABCD$ and $DEFG$ are squares.</p>  <p>Prove that triangles AGD and ECD are congruent. (4 marks)</p>
<p>Standard trigonometric ratios</p>	<p>6</p>	<ul style="list-style-type: none"> • Know and use SOHCAHTOA 	<p>Calculate the size of angle x. (3 marks)</p> 
<p>Arc lengths and sectors</p>	<p>5</p>	<ul style="list-style-type: none"> • Calculate arc length by using fraction of circumference $l = \frac{\theta}{360} \times \pi d$ • Calculate sector area by using fraction of area $A = \frac{\theta}{360} \times \pi r^2$ 	<p>The diagram shows a minor sector of a circle of radius 13 cm.</p>  <p>Work out the perimeter of the sector. (4 marks)</p>

Derive triangle results	5	 <p>(a) Calculate the length of MN (b) Explain why angle A = angle L</p>	
Enlargements and negative SF	5	 <ul style="list-style-type: none"> Understand the effect of enlarging a shape by a negative scale factor Understand how to enlarge a shape by a negative scale factor <p>Enlarge by scale factor $-\frac{1}{3}$</p>	
Loci	5	<p>Below is a diagram of a hall. There is a front door at one end of the hall and a patio door at the other. There are two burglar alarm sensors, one at A and one at B. The range of each sensor is 4m</p>  <p>The alarm is switched on. Is it possible to walk from the front door to the patio door without setting off the alarm?</p>	
Pythagoras	5	<ul style="list-style-type: none"> Prove whether or not a triangle is right-angled Calculate the longest side (hypotenuse) Calculate a shorter side Solve problems <p>A frame is made from wire. The frame is a trapezium. Calculate the total amount of wire needed to make the frame. Give your answer to 1 decimal place.</p> 	
Similarity and Congruence	5	<ul style="list-style-type: none"> Understand what it means when two shapes are congruent Identify pairs of congruent shapes Understand that when two shapes are similar that one is an EXACT enlargement of the other Calculate missing sides and angles on similar shapes 	
Standard constructions	5	<ul style="list-style-type: none"> Construct angle bisectors Construct perpendicular bisectors 	
Surface Area	5	<ul style="list-style-type: none"> Calculate surface areas of shapes Calculate missing lengths given the surface area 	

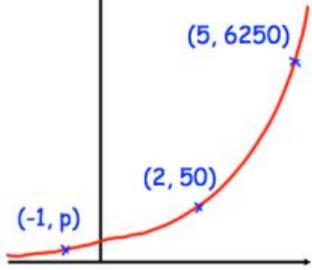
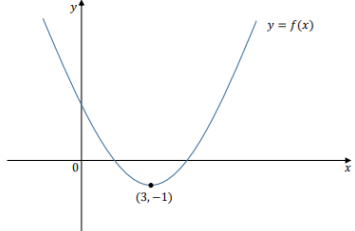
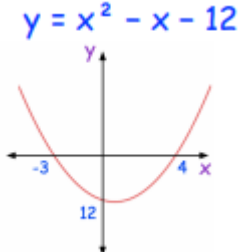
		<p>Jamie is trying to work out the surface area of the cuboid below. Can you spot any mistakes?</p> $9 \times 5 = 45$ $7 \times 5 = 35$ $9 \times 7 = 63$ $45 + 35 + 63 = 143\text{cm}^3$	
Trigonometric ratios	5	<ul style="list-style-type: none"> Know exact trig values Understand how to label a triangle to solve trig problems Decide which trig ratio to use to solve a problem Calculate missing sides Calculate missing angles <p>Spot the mistakes: Find the size of the angle x.</p> 	
Volume	5	<ul style="list-style-type: none"> Understand how to calculate volumes of cubes and cuboids Understand how to calculate volumes of prisms Understand how to calculate volumes of cones and spheres 	
Alternate and corresponding angles	4	<ul style="list-style-type: none"> Know that alternate angles are in a Z shape and corresponding angles are in an F shape Calculate missing angles on parallel lines 	
Area of a circle	4	<ul style="list-style-type: none"> Know the formula for area of a circle Solve problems involving area of a circle <p><u>Example:</u> which shape has the greatest area?</p> 	

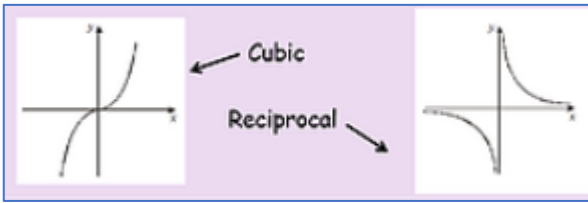
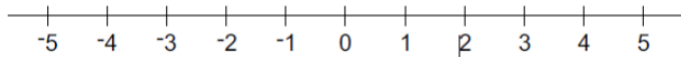
Areas of composite shapes	4	<p>The diagram shows a rectangle with a circle cut out. The rectangle has length 20cm and width 11cm. The circle has diameter 8cm. Work out the shaded area. Give your answer correct to 2 decimal places.</p> 	
Areas of triangles, trapezia and parallelograms	4	<p>Shown is a cross-section of a river. Calculate an estimate of the area of the cross section by considering the trapezium, rectangle and triangle.</p> 	
Bearings	4	<ul style="list-style-type: none"> Understand that a bearing is an angle measured clockwise from North and written using 3 figures Calculate bearings using angle facts <p>The diagram shows the position of two airplanes, P and Q.</p>  <p style="text-align: right;">Not drawn accurately</p> <p>The bearing of Q from P is 070°.</p> <p>Calculate the bearing of P from Q.</p>	
Circle terminology	4	<p>Know the names of different parts of a circle</p> <div style="display: flex; flex-wrap: wrap;"> <div style="width: 33%;">(a) </div> <div style="width: 33%;">(b) </div> <div style="width: 33%;">(c) </div> <div style="width: 33%;">(d) </div> <div style="width: 33%;">(e) </div> <div style="width: 33%;">(f) </div> <div style="width: 33%;">(g) </div> <div style="width: 33%;">(h) </div> <div style="width: 33%;">(i) </div> </div>	
Circumference of a circle	4	<ul style="list-style-type: none"> Know the formula for circumference of a circle Solve problems involving perimeters of shapes made from circles <p><u>Example</u></p> <p>James has a bicycle. Each wheel has diameter 45cm. James cycles his bicycle in a straight line in the playground. The front wheel makes 15 complete revolutions. How far does the bicycle travel? Give your answer in metres.</p> 	

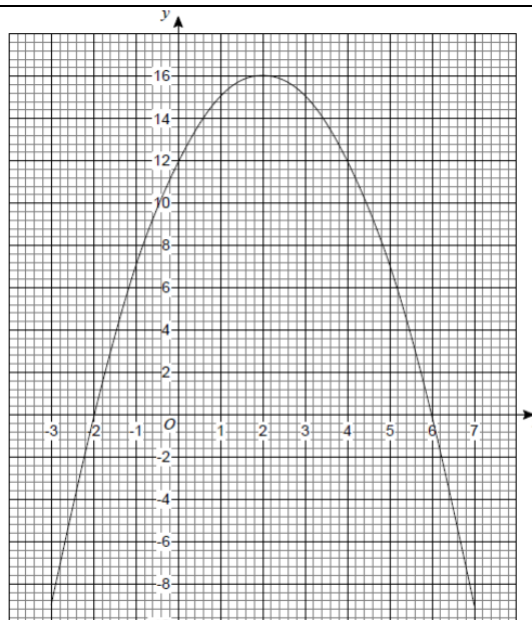
Congruent triangles	4	Hannah and Chris each draw a triangle with one side of 3cm, one angle of 35° and one angle of 80°. Hannah says their triangles must be congruent. Is Hannah correct?	
Enlargements and fractional SF	4	 <p>Triangle ABC is drawn on the grid.</p> <p>Enlarge triangle ABC with scale factor $\frac{1}{2}$ and centre (0,0)</p>	
Perimeter of 2D shapes	4	<ul style="list-style-type: none"> Understand what is meant by perimeter <p>The perimeter of the rectangle and the square are the same. Calculate the width of the rectangle, x.</p> 	
Plans and elevations	4	<ul style="list-style-type: none"> Draw and use 2D representations of 3D shapes. <p>The plan, front elevation and side elevation of a solid prism are drawn on a centimetre grid. In the space below, draw a sketch of the solid prism. Write the dimensions of the prism on your sketch.</p> 	
Polygons	4	<ul style="list-style-type: none"> Know the sum of angles in different polygons Be able to calculate missing angles in polygons Calculate how many sides a polygon has given an interior OR exterior angle (know that exterior angles sum to 360° and interior + exterior angle = 180°) 	
Solve geometrical problems	4	<ul style="list-style-type: none"> Calculate missing angles and give reasons for my answers 	
Vector arithmetic	4	Add, subtract and multiply vectors	
Volume of prisms	4	<p>Calculate the volume of the triangular prism.</p> 	

ALGEBRA

Title	Grade	What it looks like	I can do this
Approximate solutions to equations using iteration.	9	Starting with $x_0 = 0$, use the iteration formula $x_{n+1} = \frac{1}{2} - \frac{x_n}{2}$ twice to find an estimate for the solution of $x^3 + 2x = 1$	
Equation of a circle	9	A circle C has centre O The points A (0, 6) and B (8, 6) lie on the diameter of C. (a) Find the coordinates of the centre O. (b) Write down the equation of the circle	
Equation of a tangent	8	Here is a circle, centre O, and the tangent to the circle at the point (2, -4). Find the equation of the tangent at the point P.	
Algebra and Proof	8	Prove algebraically that the sum of the squares of two odd integers is always even.	
Gradients and area under a graph	8	The graph below shows information on how an empty container is being filled with water. How much water is in the container after 40 seconds?	
Graphs of trigonometric functions	8	Sketch the graph of $y = \cos(x)$	
Quadratic equations (completing the square)	8	Solve the equation by completing the square: $X^2 - 12x + 35 = 0$	
Composite functions	7	$f(x) = 2x + 1$ $g(x) = x - 5$ Find: i) $f(4)$ ii) $g(-2)$ iii) $fg(x)$ iv) $gf(x)$	
Expand the product of two or more binomials	7	Expand $(2x + 3)(x - 4)(x + 5)$	
Factorising difficult quadratic expressions	7	Factorise $6x^2 - 5x - 4$	
Geometric Sequences	7	Tom says 2, 6, 8, 16, 32 is a geometric sequence. John says 5, 10, 20, 50 is a geometric sequence. Who is correct?	

<p>Graphs of exponential functions Real-life exponential graphs</p>	7	 <p>The sketch shows a curve with equation $y = ab^x$ where a and b are constants and $b > 0$</p> <p>The curve passes through the points $(2, 50)$, $(5, 6250)$ and $(-1, p)$</p> <p>Calculate the value of p</p>	
<p>Quadratic equations (needing re-arrangement) Quadratic equations (quadratic formula)</p>	7	<p>Solve the equation $2x^2 = 4x + 2$ Give your answers to 3 sig fig</p>	
<p>Simultaneous equations (non-linear)</p>	7	<p>Solve the following: $5x + y = 5$ $2x^2 - 9x - y = 11$</p>	
<p>Solve quadratic inequalities Represent quadratic inequalities</p>	7	<p>Solve the inequality $x^2 + 5x + 6 > 0$ Represent this on a number line</p>	
<p>Translations and reflections of a function</p>	7	<p>The minimum point is $(3, -1)$ Find the minimum point for:</p> <ol style="list-style-type: none"> $y = f(x - 3)$ $y = 2f(x)$ $y = f(3x)$ 	
<p>Turning points & completing the square</p>	7	<p>What is the turning point of $(x + 3)^2 - 9 = 0$</p>	
<p>Algebraic fractions</p>	6	<p>Express as a single fraction</p> $\frac{x^2 + 5x + 6}{4} \times \frac{2}{x + 2}$	
<p>Identifying parallel lines</p>	6	<p>Circle the equation that is parallel to $y = 5x - 2$</p> $y = 2x - 5$ $y = 5x + 2$ $y = 3x - 2$ $y = -15x - 2$	
<p>Inverse functions</p>	6		
<p>Linear inequalities in two variables</p>	6		
<p>nth term of a quadratic sequence</p>	6	<p>Find the nth term for the sequence 3 9 19 33 51</p>	
<p>Quadratic equations (factorisation)</p>	6	<p>Factorise $x^2 - 3x - 10$</p>	
<p>Quadratic equations (graphical methods)</p>	6	<p>Solve the equation using the graph</p> $y = x^2 - x - 12$ 	
<p>Represent linear inequalities</p>	6	<p>On a grid, clearly indicate the region that satisfies all these inequalities: $y < x$, $y \geq 1$ and $x + y \leq 4$</p>	
<p>Simultaneous equations (linear)</p>	6	<p>Solve: $6x + 3y = 45$ $2x - 2y = 12$</p>	

Algebraic terminology	5	<ul style="list-style-type: none"> Know the difference between 'equation' 'expression' and 'formula' Understand what it means when I see the words 'simplify' or 'solve' 	
Cubic and Reciprocal graphs Reciprocal real-life graphs	5	<ul style="list-style-type: none"> Know shapes of cubic and reciprocal graphs 	
Deduce quadratic roots algebraically	5	<ul style="list-style-type: none"> Solve quadratic equations by factorising and understand that the solutions are where the graph crosses the x-axis (roots) <p style="text-align: center;">Solve for x:</p> $x^2 + 5x + 6 = 0$ $(x + 3)(x + 2) = 0$ $x + 3 = 0 \quad x + 2 = 0$ $x = -3 \quad x = -2$	
Derive an equation	5	<p>Fiona is x years old. Thomas is 3 years older than Fiona. Cara is twice as old as Fiona. The sum of their ages is 51. (a) Form an equation in terms of x (b) Solve the equation and work out Fiona's, Thomas's and Cara's ages.</p>	
Equation of a line	5	<ul style="list-style-type: none"> Understand that straight line graphs have equations of the form $y = mx + c$ Understand that parallel lines have the same gradient Rearrange equations to find gradients and intercepts 	
Expand the product of two binomials	5	Expand and simplify $(x + 2)(x - 5)$	
Factorising quadratic expressions	5	Factorise $x^2 + 7x + 10$	
Fibonacci, quadratic and simple geometric sequences	5	<p>Here are the first six terms of a Fibonacci sequence.</p> <p style="text-align: center;">1 1 2 3 5 8</p> <p>The rule to continue a Fibonacci sequence is: the next term in the sequence is the sum of the two previous terms. Find the 9th term of this sequence.</p>	
Graphical solution to equations	5		
Inequalities on number lines	5	<p>a) Solve the inequality $3x - 2 \leq 10$ (b) Represent your solution to part (a) on the number line.</p> 	
Linear equations	5	<p>Solve the following:</p> <ul style="list-style-type: none"> $2x = 18$ $x + 2 = 5$ $\frac{x}{3} = 15$ $5x = 2x + 18$ 	
Quadratic graphs	5	The graph $y = a + bx - x^2$ is shown.	



Circle the coordinates of the turning point of the curve.

(-2, 0) (0, 12) (2, 16) (6, 0)


(b) Circle the value of a.

-2 12 16 6


(c) Circle the two roots of $a + bx - x^2 = 0$

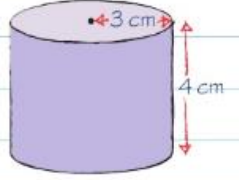
-2 and 6 2 and -6 2 and 6 -2 and -6

		<p>Circle the coordinates of the turning point of the curve.</p> <p>(-2, 0) (0, 12) (2, 16) (6, 0)</p> <p>(b) Circle the value of a.</p> <p>-2 12 16 6</p> <p>(c) Circle the two roots of $a + bx - x^2 = 0$</p> <p>-2 and 6 2 and -6 2 and 6 -2 and -6</p>	
Simplify indices	5	<ul style="list-style-type: none"> • $m^2 \times m^3$ • $n^7 \div n^5$ • $(y^4)^3$ • $(2x^3)^4$ 	
Simplify surds	5	Simplify $\sqrt{75}$	
Solve linear inequalities in one variable	5	Solve the inequality $4x + 7 < 11$	
Writing formulae and expressions	5	An orange costs y pence and a banana costs z pence. Write an expression for the total cost of 2 bananas and 3 oranges.	
Changing the subject	4	The circumference of a circle is given as $c = 2\pi r$ Make the radius, r, the subject of the formula.	
Collecting like terms	4	Simplify $6m - 2s + 11s + m$	
Expressions	4	Write an expression for the perimeter of the shape below:	
Factorise single bracket	4	Factorise the following: $25y - 35z$ $8x^2 + 20$	
Finding the equation of a line	4	Find the equation of the line below: 	
Graphs of linear functions	4	<ul style="list-style-type: none"> • Understand that equations of the form $y = mx + c$ correspond to straight line graphs 	

		Plot straight line graphs given their equation, e.g. 'plot the graph of $y = 2x - 3$ for values of x between -2 and 2	
Graphs of quadratic functions	4	<ul style="list-style-type: none"> Know what quadratic graphs look like Be able to plot quadratic graphs, e.g. 'plot the graph of $y = x^2 - 2x$ for values of x between -2 and 3	
Multiplying single brackets	4	Expand $4a(3a^2 - 6a + 2)$	
nth term of a linear sequence	4	Find the nth term of the sequence 3 7 11 15 19	
Number machines	4	Here is a number machine:  <p>(a) Work out the output when the input is 4 (b) Work out the input when the output is 11 (c) Show that there is a value of the input for which the input and the output have the same value</p>	
Substitution	4	$f = 5x + 2y$ $x = 3$ and $y = -2$ Find the value of f .	
Using " $y = mx + c$ "	4	A line has the equation $y = 4x - 5$ a) What is the gradient of the line? b) What is the y-intercept of the line?	


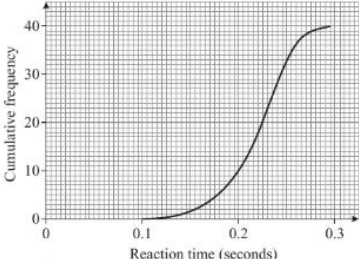
NUMBER

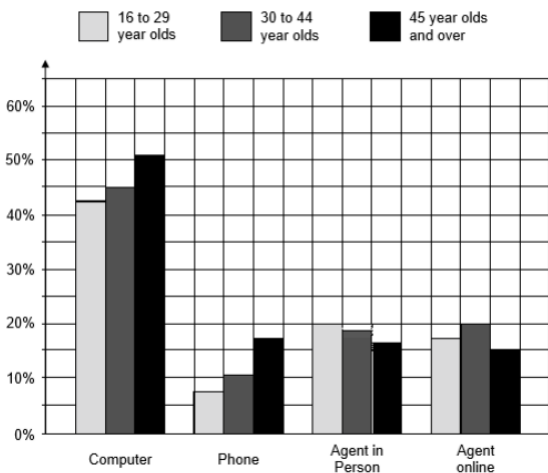
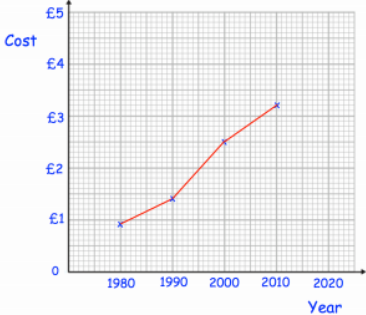
Title	Grade	What it looks like	I can do this
Surds	8	<ul style="list-style-type: none"> Use multiplication rule for surds Use division rule for surds Simplify surds Add/subtract surds Rationalise denominators <p>1 Write $\sqrt{32} + \sqrt{98}$ in the form $p\sqrt{2}$ where p is an integer. Show each stage of your working clearly. (2 marks)</p> <p>2 Show that $\frac{35}{\sqrt{7}} = 5\sqrt{7}$ (2 marks)</p>	
Index Laws (negative and fractional)	7	<ul style="list-style-type: none"> Know that negative indices cause a reciprocal Know that fractional indices need multiple steps – denominator = which root to do; numerator = which power to raise it to <p>Given that $81^{-\frac{3}{4}} = 3^n$, find the value of n. (3 marks)</p> <p>Write $\sqrt{\frac{49}{7^3}}$ as a single power of 7. Show every step of your working clearly. (3 marks)</p>	
Product rule	7	<ul style="list-style-type: none"> Know strategies that can be used to calculate total number of combinations of a given context <p>The lock on this briefcase has three dials. The first dial can be any letter and the last two dials can be any digit from 0 to 9. Here is one possible combination.  (a) How many different ways are there of setting the code? (2 marks)</p>	
Recurring Decimals	7	<ul style="list-style-type: none"> Use an algebraic method to convert recurring decimals to fractions by multiplying by powers of 10 <p>Prove that the recurring decimal $0.0\dot{1}\dot{8}$ has the value $\frac{1}{55}$ (2 marks)</p>	
Upper and lower bounds	7	<ul style="list-style-type: none"> Know that rounded answers have a range of accuracy Calculate with UB and LB to find maximum & minimum outcomes of calculations <p>The area of a rectangle is 320 cm^2. The length of the rectangle is 22 cm. Both values are correct to 2 significant figures. Calculate the lower bound for the width of the rectangle. Show your working clearly. (3 marks)</p>	
Finance 1	6	<ul style="list-style-type: none"> Calculate and compare simple interest & compound interest Calculate reverse percentages Calculate percentage profits <p>A census predicts that the population of a city will decrease by 2% each year. At the end of 2014 the population of the city is 260000. Estimate the population of the city at the end of 2020. Give your answer to the nearest 100 people. (2 marks)</p>	
Powers and Roots	6	<ul style="list-style-type: none"> Know all square numbers up to 20 squared Know all cube numbers up to 6 squared Know the relationship between square/cube numbers and the square/cube roots <p>(a) Write $7^3 \times 7^5$ as a single power of 7. (1 mark)</p> <p>(b) $9625 = 5^n \times 7 \times 11$ Find the value of n. (2 marks)</p>	

Product of prime factors	6	<ul style="list-style-type: none"> Use a prime factor tree to work out the prime factor decomposition of a number Use a Venn diagram to identify HCF and LCM of numbers $X = 2 \times 3^5 \times 7^2$ $Y = 3^2 \times 5 \times 7$ (a) Find the highest common factor (HCF) of X and Y . (2 marks) (b) Find the lowest common multiple (LCM) of X and Y . (2 marks)	
Using Pi	6	<ul style="list-style-type: none"> Work in terms of pi Leave answers in terms of pi <p>In terms of π</p> <p>Unless a question asks you for a specific degree of accuracy, you can give your answers as a whole number or fraction multiplied by π. An answer given in terms of π is an exact answer rather than a rounded answer.</p> 	
Calculating with fractions	5/4	<ul style="list-style-type: none"> Add/Subtract fractions Multiply fractions Divide fractions (KFC) <p>Work out</p> (a) $\frac{7}{10} - \frac{1}{4}$ (2 marks) (b) $3\frac{4}{9} + 1\frac{5}{6}$ (3 marks) (c) $\frac{3}{4} \div \frac{5}{12}$ (2 marks) (d) $1\frac{7}{8} \times 2\frac{2}{3}$ (3 marks)	
Error intervals	5	<ul style="list-style-type: none"> Use inequalities to express upper and lower bounds <p>The mass of a coin is 8 grams to the nearest gram. Complete the error interval for the mass of the coin</p> <p>..... g \leq mass < g</p>	
Index Laws	5	Know and use the laws of indices to simplify expressions	
Limits of accuracy	5	A rectangular football pitch has a width of 72m, measured to the nearest metre. The length of the pitch is 105m, measured to the nearest 5 metres. Work out the lower bound for the perimeter of the pitch.	
Checking calculations	4	Does your answer seem reasonable?	
Compound measures	4	<ul style="list-style-type: none"> Know and use the formulae for <ul style="list-style-type: none"> Speed, distance, time Mass, density volume Pressure, force, area	
Converting metric units	4	Mary runs 600m every day. Work out how far Mary runs in one week. Give your answer in kilometres.	
Estimation	4	Estimate answers to calculations by rounding all the numbers in the problem to 1 significant figure	
Fractions, ratio and percentages problems	4	On Thursday, some adults and children were at the theatre. The ratio of the number of adults to children was 2:4. Each person had a seat in the Circle or had a seat in the Stalls. $\frac{3}{4}$ of the children had seats in the Stalls. 120 children had seats in the Circle. There are exactly 1300 seats in the theatre. On this particular Thursday, were there people on more than 70% of the seats? You must show how you get your answer.	
Interpret calculator displays	4	Write the correct degree of accuracy, e.g. decimal places.	

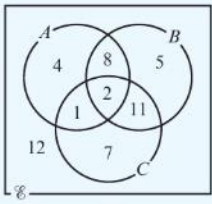
LCM and HCF	4	The lowest common multiple of two numbers is 60. Only one of the numbers is a multiple of 4. Write down two possible numbers.	
Multiples and factors	4	Mary has 26 sweets and is able to share them evenly between her friends. Mary has more than 1 friend. Write down how many friends Mary might have.	
Operations	4	Perform all four operations.	
Order of operations	4	<ul style="list-style-type: none"> • Use BIDMAS to work out the answer to a calculation • Be able to spot when an answer is incorrect because BIDMAS has not been used 	
Powers	4	Know difference between 4^3 and 4×3	
Rounding	4	Round numbers to <ul style="list-style-type: none"> - Nearest 10, 100, 1000 - 1, 2, or 3 decimal places 1, 2 or 3 significant figures	
Standard Form	4	The distance between London and New York is 5,567,000 metres. Write this number in standard form.	
Terminating decimals and fractions	4	Write 0.23 as a fraction.	

STATISTICS

Title	Grade	What it looks like	I can do this												
Boxplots	6	<ul style="list-style-type: none"> Accurately plot median, largest, smallest and IQR values Calculate IQR Read box plot for median, range, IQR Compare data using range, median or IQR from box plot <p>The box plot gives information about the heights, in metres, of the trees in a park.</p>  <p>There are 162 trees in the park. Estimate the number of trees that are less than 10 m tall. (1 mark)</p>													
Cumulative frequency	6	<p>Now try this</p> <p>This cumulative frequency graph shows the reaction times recorded by a group of students in an experiment. Estimate the median and interquartile range of the reaction times. (3 marks)</p> <p>Draw lines on your graph to show the values you are reading off.</p>  <p>Worked solution video</p>													
Histograms with equal and unequal class widths	6	<ul style="list-style-type: none"> Calculate frequency density Know that the area of the bar represents frequency Estimate frequency using histogram <p>A speed camera recorded the speed of some vehicles on a motorway. The table on the right shows the results.</p> <p>(a) On graph paper, draw a histogram to illustrate this data. (3 marks)</p> <p>(b) Estimate the proportion of vehicles travelling at more than 65 mph. (2 marks)</p> <table border="1" data-bbox="1093 1220 1380 1377"> <thead> <tr> <th>Speed, s (mph)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>$0 < s \leq 40$</td> <td>48</td> </tr> <tr> <td>$40 < s \leq 50$</td> <td>32</td> </tr> <tr> <td>$50 < s \leq 70$</td> <td>128</td> </tr> <tr> <td>$70 < s \leq 80$</td> <td>88</td> </tr> <tr> <td>$80 < s \leq 110$</td> <td>24</td> </tr> </tbody> </table>	Speed, s (mph)	Frequency	$0 < s \leq 40$	48	$40 < s \leq 50$	32	$50 < s \leq 70$	128	$70 < s \leq 80$	88	$80 < s \leq 110$	24	
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Quartiles and Interquartile Range	6	<ul style="list-style-type: none"> Calculate IQR, UQ and LQ Use IQR to compare spread of data <p>Henry measures the heights of some plant seedlings for an experiment. This stem-and-leaf diagram shows his results.</p> <p>(a) How many plant seedlings did Henry measure? (1 mark)</p> <p>(b) Work out the median height. (2 marks)</p> <p>(c) Work out the interquartile range of this data. (3 marks)</p> <pre> 4 0 2 4 4 5 9 5 1 3 3 4 7 8 9 6 2 2 5 6 8 7 1 </pre> <p>Key: 5 3 means 5.3 cm</p>													
Scatter graphs	5	<ul style="list-style-type: none"> Describe correlation Draw a line of best fit Estimate values Understand that extrapolation is unreliable 													
Comparing data using graphs	4	The bar chart shows how people in different age groups book their holidays.													


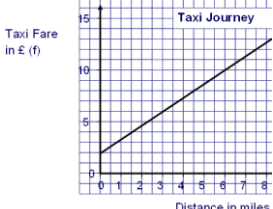
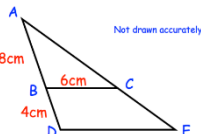
		<p style="text-align: center;">Holiday bookings</p>  <p>Compare the bookings for 30 to 44 year olds with the bookings for 45 year olds and over.</p>	
Comparing Distributions	4	<p>Use averages to compare data sets</p> <ul style="list-style-type: none"> - Compare medians - Compare ranges (consistency of data) 	
Population	4	Know the difference between a census and a sample	
Sampling	4	Know what is meant by a random sample	
Time series	4	<p>The time series graph shows the price of coffee in a shop over 30 years.</p>  <p>Carlos says that the price of a coffee will be £3.60 by 2020. Do you agree with Carlos? Explain your answer.</p>	


PROBABILITY

Title	Grade	What it looks like	I can do this										
Conditional Probability	7	<ul style="list-style-type: none"> Select appropriate values from given information to work out probability of one thing <u>given</u> another <p>This Venn diagram shows the burger toppings chosen by a group of 50 diners at a restaurant. The choices are avocado (A), bacon (B) and cheese (C).</p>  <p>A diner is chosen at random. (a) Given that the diner chooses bacon, find the probability that she also chooses avocado. (2 marks)</p>											
Probability of dependent events	5	<ul style="list-style-type: none"> Know that the second event's probability will be different following the first event Recognise when the second event probability changes (non replacement, picking two or 3 from the same set...) <p>There are 3 strawberry yoghurts and 4 pineapple yoghurts in a fridge. Noah picks two yoghurts at random. Work out the probability that both the yoghurts are the same flavour. (4 marks)</p>											
Probability of independent events	5	<ul style="list-style-type: none"> Reason that events do not impact each others likelihood Probability of both occurring is the product of each event occurring <p>Golden rules</p> <p>1 Look out for the words replace or put back in a probability question. With replacement: probabilities stay the same. Without replacement: first probability stays the same while the others change.</p> <p>2 MULTIPLY ALONG THE BRANCHES ADD UP THE OUTCOMES</p>											
Mutually exclusive sum	4	<ul style="list-style-type: none"> Two events are mutually exclusive if they cannot happen at the same time. For mutually exclusive events ADD the probabilities. <p><u>Example:</u> Finn has some sweets in a bag. 5 of the sweets are lemon flavoured. 7 of the sweets are strawberry flavoured. The rest of the sweets are mint flavoured. Work out the probability that a sweet picked at random is lemon or mint flavoured.</p>											
Relative Frequency	4	<p>A spinner lands of white, black, red or orange. The relative frequencies after 300 spins are shown in the table below.</p> <table border="1" data-bbox="683 1637 1297 1744"> <thead> <tr> <th>Colour</th> <th>White</th> <th>Black</th> <th>Red</th> <th>Orange</th> </tr> </thead> <tbody> <tr> <th>Relative Frequency</th> <td>0.25</td> <td>0.4</td> <td>0.2</td> <td>0.15</td> </tr> </tbody> </table> <p>Work out how many times the spinner landed on Red.</p>	Colour	White	Black	Red	Orange	Relative Frequency	0.25	0.4	0.2	0.15	
Colour	White	Black	Red	Orange									
Relative Frequency	0.25	0.4	0.2	0.15									
Tables and Grids	4	<p>Complete the table. Work out the probability that a student picked at random has blue eyes.</p>											

		<table border="1"> <thead> <tr> <th></th> <th>blue eyes</th> <th>brown eyes</th> <th>green eyes</th> <th>total</th> </tr> </thead> <tbody> <tr> <th>boys</th> <td>5</td> <td></td> <td>4</td> <td>12</td> </tr> <tr> <th>girls</th> <td></td> <td>7</td> <td></td> <td></td> </tr> <tr> <th>total</th> <td></td> <td></td> <td>9</td> <td>30</td> </tr> </tbody> </table>		blue eyes	brown eyes	green eyes	total	boys	5		4	12	girls		7			total			9	30	
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Theoretical Probability	4	What is the probability of landing on an even number if a fair die is rolled?																					
Unbiased Samples	4	Know why these are important																					
Venn Diagrams	4	$\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$ $A = \{\text{factors of } 20\}$ $B = \{\text{prime numbers less than } 20\}$ (a) List the members of the set $A \cap B$. (2 marks) (b) Is 7 a member of $A \cup B$? Explain your answer. (2 marks) (c) Show all of this information on a Venn diagram. (4 marks)																					

RATIO, PROPORTION & RATES OF CHANGE

Title	Grade	What it looks like	I can do this
Gradients and the rate of change	9	<p>Hugh has a bucket with holes in it. Hugh fills the bucket with water and records the depth of water. The graph shows the depth of water in the bucket.</p> <p>(a) Work out the average rate of change of depth of water between 0 and 2 seconds.</p> <p>(b) Work out the average rate of change of depth of water between 2 and 6 seconds.</p> 	
General iterative processes	7	<p>Using $x_{n+1} = 8 - \frac{5}{x_n^2}$</p> <p>with $x_0 = 1$</p> <p>find the values of x_1, x_2, x_3 and x_4</p>	
Direct and inverse proportion	6	<p>The force, F newtons, exerted by a magnet on a metal object is inversely proportional to the square of the distance d cm/ When the d = 2cm, F = 60N</p> <p>(a) Express F in terms of d (b) Find the force when the distance between the magnet and the metal object is 10cm (c) Find the distance between the magnet and the metal object when the force is 15N.</p>	
Gradient & the rate of change	5	 <p>Find the gradient of the line.</p> <p>What does the gradient represent?</p>	
Growth and decay	5	<p>Becky invests £5000 for 2 years in a bank account. She gets compound interest at a rate of 3% per year.</p> <p>Work out the total amount of interest Becky gets by the end of 2 years.</p>	
Percentage change	5	<p>In 2005 the population of Redpool was 11546. In 2015 it was 13671. Write down the increase in population as a percentage.</p>	
Compound units	5	<p>Philip runs at an average speed of 4 m/s.</p> <p>How long will it take Philip to complete a 10 kilometer race?</p> <p>Give your answer in minutes and seconds.</p>	
Scale factors and similarity	5	 <p>Work out the length of DE.</p>	
Simple Interest and Financial Maths	5	<p>Becky invests £5000 for 2 years in a bank account. She gets simple interest at a rate of 3% per year.</p>	

		Work out the total amount of interest Becky gets by the end of the 2 years.	
Solve Proportion Problems and interpret these	5	A 345ml tin of paint costs £4.80 A 250ml tin of paint costs £3.35 Which tin is better value for money?	
Compare Fractions, Decimals and Percentages	4	Arrange these numbers from smallest to largest $\frac{1}{4}$ 0.19 0.3 26% $\frac{1}{5}$	
Compare lengths, area, volume	4	Work out the area in m ² . Work out the area in cm ² . 	
Comparing quantities as a ratio	4	Compare 3:15 and 1:6. How are they similar? How are they different?	
Express one quantity as a % of another	4	There are 25 red balls, 20 blue balls and 5 yellow balls in a bag. What percentage of the balls are blue?	
Percentage change	4	Riddington and Grenwick are two small villages. The population of Riddington has increased from 80 people to 120 The population of Grenwick has decreased from 200 people to 120 Show that Riddington has had the greater percentage change in its You must show all your working.	
Problems involving ratio	4	In a tin of baked beans, Weight of beans : weight of tomatoes : weight of other ingredients There are 150 g of tomatoes in the tin. Work out the weight of the beans.	
Proportion and ratio	4	8 Scones 200g flour 30g caster sugar 50g butter 140ml milk 1 egg How much of each ingredient would be needed for: (a) 16 scones? (b) 4 scones? (c) 2 scones? (d) 40 scones? (e) 80 scones? (f) 100 scones?	
Ratio and fractions	4	Only blue vans and white vans are made in a factory. The ratio of the number of blue vans to the number of white vans is 2:3 (a) Write down the fraction of vans that are blue.	
Ratio Sharing	4	Divide 63ml in the ratio 2:3:4	