
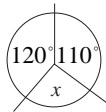
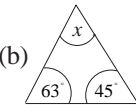
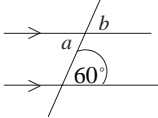
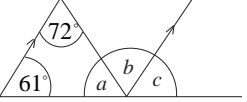
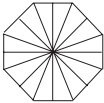


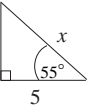

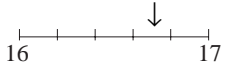
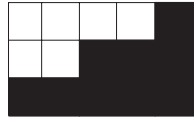
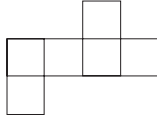
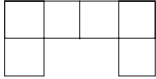
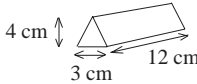



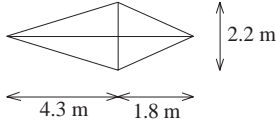

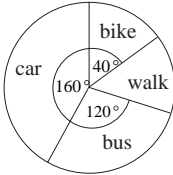
Hrs	Topic	Notes	Examples	References	Page
(4)	<b>1. INDICES</b>  R: Multiplication and division Factors  <b>C: Squares, cubes; square roots            and cubes roots</b>  <b>Prime factors</b>  * E: <i>Index notation</i>	Knowing tables up to 10  Positive integers only  Positive integer powers only	What is $5 \times 5$ ? How many 6's in 48? Find the factors of 20.  Find $3^2$ , $2^3$ , $\sqrt{25}$ , $\sqrt[3]{64}$  Find the HCF of 216 and 240.  Simplify $a^5 \times a^3$ ; $m^4 \div m^2$		
(5)	<b>2. FORMULAE</b>  R: Evaluate simple formulae with positive integers  <b>C: Construct and use simple            formulae</b>  E: <i>Substitution of any numbers            into simple formulae</i>	With and without a calculator	Find $A = \ell b$ when $\ell = 3$ , $b = 5$ .  Find perimeter of  when $a = 8$ and $b = 3$ .  Given $q = -2$ , $v = 2.1$ , find the value of $\sqrt{v^2 - q^2}$ .		
(6)	<b>3. ANGLE GEOMETRY</b>  R: Drawing and measuring angles with a protractor  Line and rotational symmetry of 2-D objects  <b>C: Angle properties of straight            lines, points, triangles,            quadrilaterals and parallel lines</b>	Up to $360^\circ$	Find all the lines of symmetry of a square  Find $x$ when (a)  (b) 		

Hrs	Topic	Notes	Examples	References	Page
	<p><i>E: Angle symmetry properties of polygons</i></p> <p>* <i>Symmetry properties of 3-D shapes</i></p> <p><i>Compass bearings</i></p>	<p>Include line and rotational symmetry</p> <p>Include plane, axis and point symmetry</p> <p>8 compass points and 3-figure bearings</p>	<p>Find <math>a</math> and <math>b</math>.</p>  <p>Find <math>a</math>, <math>b</math> and <math>c</math></p>  <p>Calculate the interior angle of a regular decagon</p> <p>Shade in diagram so that it has rotational symmetry of order 4 but no lines of symmetry.</p>  <p>Describe fully the symmetries of this shape.</p>  <p>Scale drawings of 2-stage journeys</p>		
(6)	<p><b>4. TRIGONOMETRY: PYTHAGORAS' THEOREM</b></p> <p>R: Classification of triangles</p> <p>Area of squares</p> <p><b>C: Pythagoras' Theorem</b></p> <p><i>E: Trigonometry (sin, cos, tan)</i></p>	<p>Isosceles, equilateral, scalene, right-angled</p> <p>Whole numbers only</p> <p>2-D only</p> <p>Angles of elevation and depression</p> <p>Bearings</p> <p>2-D with right-angled triangles only</p>	<p>Find the area of a square of side 4 cm.</p> <p>Find <math>x</math>.</p>  <p>A ship goes from A to B on a bearing <math>040^\circ</math> for 20 km. How far north has it travelled?</p> <p>Find <math>x</math>.</p>  <p>Find <math>x</math>.</p> 		

Hrs	Topic	Notes	Examples	References	Page																																			
(10)	<p><b>5. PROBABILITY</b></p> <p>R: Basic probability; practical probability Probability scale</p> <p><b>C: Simple probability</b></p> <p><b>Complementary events</b></p> <p><b>Listing combined outcomes of 2 experiments</b></p> <p><i>E: Relative frequency – experimental probability and expected results</i></p> <p><i>Appropriate methods of determining probabilities</i></p> <p><i>Probability of 2 events</i></p> <p>* <i>Multiplication law for independent events</i></p>	<p>Using coins, dice, cards, etc.</p> <p>Likely and unlikely events</p> $\sum p_i = 1; p + p' = 1$ <p>By systematically writing down all the combinations of the 2 events</p> <p>Tree diagrams to help find all possible outcomes</p> <p>Using symmetry, experiment</p> <p>Simple tree diagrams</p> <p>By listing, tabulation or tree diagrams</p> <p>Sampling <b>with</b> replacement</p>	<p>If you toss a coin 100 times, how many heads would you expect?</p> $p(\text{heads on fair coin}) = \frac{1}{2}$ <p>If <math>p(\text{rain tomorrow}) = \frac{2}{3}</math>, what is <math>p(\text{dry tomorrow})</math>?</p> <p>If two people can select coke, orange or lemonade from a vending machine, list all the possible combinations of their choices.</p> <p>Complete table for sums of numbers on 2 dice.</p> <table style="margin-left: 20px;"> <tr> <td></td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>What is the probability of scoring 7?</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>...</td> <td>...</td> </tr> <tr> <td></td> <td>2</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> </tr> <tr> <td></td> <td>3</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> <td>...</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>etc.</td> <td></td> </tr> </table> <p>Experiment to find probability of drawing pin landing point up.</p> <p>If <math>p(\text{rain}) = \frac{2}{3}</math>, how many rainy days would you expect out of 30 days?</p> $p(\text{ace}) = \frac{4}{52} = \frac{1}{13}$ <p>There are 5 green, 3 red and 2 white balls in a bag. What is the probability of obtaining</p> <p>(a) a green ball (b) a red ball (c) a non-white ball?</p> <p>Find the probability of obtaining a head on a coin and a 6 on a die.</p>		1	2	3	4	5	6	What is the probability of scoring 7?	1	2	3	4	...	...		2	...	...	...	...	...		3	...	...	...	...	...						etc.			
	1	2	3	4	5	6																																		
What is the probability of scoring 7?	1	2	3	4	...	...																																		
	2	...	...	...	...	...																																		
	3	...	...	...	...	...																																		
					etc.																																			

Hrs	Topic	Notes	Examples	References	Page
(7)	<p><b>6. NUMBER SYSTEM: DECIMALS</b></p> <p>R: Everyday examples of (+, −, ×, ÷)</p> <p>Extend place value to decimals</p> <p>Number system</p> <p>Money</p> <p>+ , − , × , ÷ whole numbers including long multiplication and division</p> <p>Multiplying and dividing by powers of 10</p> <p><b>C: Rounding off</b></p> <p>+ , − , × , ÷ <b>decimals</b></p> <p><i>E: Estimating answers</i></p> <p><i>Use of brackets and memory on a calculator</i></p>	<p>×</p> <p>Including <math>\frac{1}{10}</math>, <math>\frac{1}{100}</math>, etc.</p> <p>Coins; changing between pence and pounds; notation, e.g. £1.27 <b>not</b> £1.27p</p> <p>Without the use of a calculator</p> <p>Decimal places and significant figures</p>	<p>Cost of 15 pens at 8p each</p> <p>Next number in sequence 0.2, 0.4, 0.6, ...</p> <p>Change 127 p to £s.</p> <p><math>127 \times 23</math>; <math>465 \div 15</math></p> <p><math>25.62 \times 100</math>, <math>216.2 \div 10</math>, <math>14 \div 0.2</math></p> <p><math>\frac{1}{7}</math> to 2 d.p.; 39.96 to 3 s.f.</p> <p><math>9.7 - 3.86</math>; <math>£3.36 \times 7</math>; <math>£114.81 \div 3</math></p> <p><math>\frac{29.4 + 61.2}{14.8} \approx \frac{30 + 60}{15} \approx 6</math></p> <p><math>\frac{2.5 \times 14.3}{7.8 + 2.95} = 3.332558</math> (to 5 d.p.)</p>		
(12)	<p><b>7. MENSURATION</b></p> <p>R: Making 3-D shapes given nets</p> <p>Using measuring instruments and appropriate units</p> <p>Appropriate degree of accuracy</p> <p>Reading and interpreting scales</p>	<p>Draw and measure angles accurately</p> <p>100 cm = 1 m, etc.</p> <p>Rounding sensibly for the range of measures used and the context</p>	<p>Draw a net of a cuboid 5 cm by 3 cm by 2 cm.</p> <p>How many mm in 2.763 m?</p> <p>Weighing a parcel to decide the postage.</p> <p style="text-align: center;">  </p>		

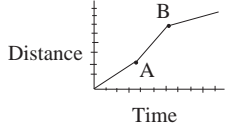
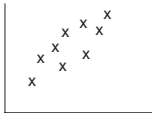
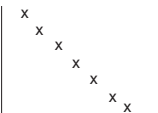

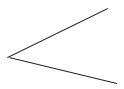
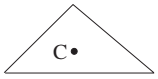
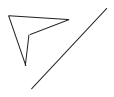

Hrs	Topic	Notes	Examples	References	Page
	<p>Area</p> <p><b>C: Constructing nets of cuboids, prisms, tetrahedrons</b></p> <p><b>Conversion of units</b></p> <p><b>Area and perimeter of squares, rectangle, triangles</b></p> <p><b>Volumes of cubes and cuboids</b></p> <p><b>Area and circumference of circles</b></p> <p><b>Volumes of triangular prisms and cylinders</b></p> <p><i>E: 2-D representations of 3-D objects</i></p> <p><i>Difference between discrete and continuous measures</i></p> <p><i>Simple upper and lower bounds</i></p>	<p>Estimating areas</p> <p>Nets can be used (see below) for surface areas and volumes.</p> <p>Familiarity with mm, cm, m, km, g, kg, tonne; inches, feet, yards, miles, oz, lb, stones, litres, gallons</p> <p><b>These formulae must be known</b>  <math>A = \pi r^2</math>, <math>C = \pi D</math>  <math>V = \text{Area of cross-section} \times \text{length}</math>  <math>V = \pi r^2 h</math></p> <p>Use of isometric paper</p> <p>To include <b>estimation</b> of measures</p>	<p>What is the value of Find the area of the shaded shape.</p>  <p>Which of these is the net of a cube? (a)  (b) </p> <p>A gallon is about <math>4\frac{1}{2}</math> litres. How many litres will an 8 gallon petrol tank hold?</p> <p>What is the volume of this chocolate bar?</p>  <p>For the side and plan elevations shown, draw an isometric diagram.</p>  <p>Illustrate current postal rates; shoe sizes</p> <p><math>l = 8 \text{ m} \Rightarrow 7.5 \leq l &lt; 8.5</math></p>		

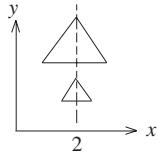
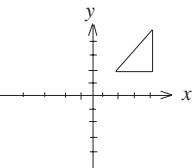
Hrs	Topic	Notes	Examples	References	Page
	<p><i>Areas of parallelograms, trapezia, kites, rhombuses and composite shapes</i></p> <p><i>Volumes of prisms and composite solids</i></p> <p><i>Surface area of simple solids: cubes, cuboids, cylinders*</i></p> <p><i>Volume/capacity problems</i></p>	<p>Area of cross-section <math>\times</math> length of prism</p> <p>Include compound measures such as density</p>	<p>Find the area of this kite.</p>  <p>Find the mass of water to fill this swimming pool.</p> 		
(7)	<p><b>8. DATA HANDLING</b></p> <p>R: Two way tables including timetables and mileage charts</p> <p>Interpreting and constructing pictograms and bar charts</p> <p><b>C: Interpreting and constructing pie charts and line graphs</b></p> <p><b>Questionnaires and surveys</b></p> <p>E: <i>Frequency graphs</i></p>	<p>Time : 12 hour and 24 hour clock</p> <p>Discrete data only</p> <p>Calculation of angles (total frequency a factor or multiple of 360)</p> <p>Fairness and bias</p> <p>For grouped data; equal intervals</p> <p>Include frequency polygons and histograms</p>	<p><math>16.27 \equiv 4.27 \text{ pm}</math></p> <p>If a train arrives at a station at 13:26, and the connection leaves at 14:12, how long do you have to wait?</p> <p>72 pupils travel by car to school. How many walk?</p> 		
(6)	<p><b>9. DATA ANALYSIS</b></p> <p>R: Mean, mode, median, range for discrete data</p>		<p>Find mean, mode, median and range for these golf scores at a particular hole:</p> <p>2, 4, 5, 4, 3, 5, 4, 4, 3, 5, 4</p>		

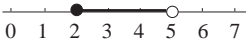
Hrs	Topic	Notes	Examples	References	Page																
	<p><b>C: Mean for discrete data and tally charts</b></p> <p><i>E: Problems involving the mean Mean, median, modal class for grouped data</i></p>	Including discrete and continuous data	<p>Find the mean number of goals on these games.</p> <table border="1"> <tr> <td>No of goals</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6 or more</td> </tr> <tr> <td>Frequency</td> <td>2</td> <td>4</td> <td>5</td> <td>3</td> <td>0</td> <td>1</td> <td>0</td> </tr> </table> <p>The mean of 6 numbers is 12.3. When an extra number is added, the mean changes to 11.9. What is the extra number?</p>	No of goals	0	1	2	3	4	5	6 or more	Frequency	2	4	5	3	0	1	0		
No of goals	0	1	2	3	4	5	6 or more														
Frequency	2	4	5	3	0	1	0														
(9)	<p><b>10. EQUATIONS</b></p> <p>R: Negative numbers (number lines) in context</p> <p>Ordering directed numbers</p> <p>+, -, ×, ÷ directed numbers</p> <p><b>C: Simplifying expressions</b></p> <p><b>Manipulating and solving simple linear equations</b></p> <p><b>Linear equations</b></p> <p><i>E: Trial and improvement methods Expansion of brackets</i></p>	<p>Temperature problems</p> <p>One fraction and/or one bracket</p>	<p><math>-6^{\circ} + 4^{\circ} = ?</math></p> <p><math>-5 - 4 = ?; (-5) \times 4 = ?</math></p> <p><math>2a + 3b - a + 2b = ?</math></p> <p><math>2(a + 6) = ?</math></p> <p>Solve <math>x + 3 = 7</math>; <math>x - 5 = 10</math>; <math>3x = 15</math></p> <p>Solve <math>2x - 3 = 7</math>; <math>3x - 4 = x + 18</math></p> <p>Solve for <math>x</math> to 2 d.p. <math>x^3 + 7x - 6 = 20</math></p> <p>Multiply out <math>(2r + 3s)(2r - 5s)</math></p>																		
(6)	<p><b>11. FRACTIONS and PERCENTAGES</b></p> <p>R: Conversion between fractions, decimals and percentages</p> <p>Finding simple fractions and percentages of quantities</p> <p><b>C: Expressing quantities as a percentage or a fraction</b></p>	<p>Know common equivalents</p> <p><math>(\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, \frac{1}{3}, \frac{2}{3}, 10\%)</math></p>	<p><math>0.5 \equiv \frac{1}{2} \equiv 50\%</math></p> <p><math>\frac{1}{4}</math> of 20, 10% of £50, 20% of 10 kg</p> <p>30 out of 50 ?</p>																		

Hrs	Topic	Notes	Examples	References	Page																
	<p><b>Finding more complex percentages and fractions of quantities</b></p> <p><i>E: Percentage and fractional changes</i></p> <p><i>Manipulating fractions</i></p>	<p>Discount, VAT, commission</p> <p>+, -, ×, ÷</p>	<p><math>\frac{3}{8}</math> of 72 = ?; 13% of £97</p> <p>VAT on hotel bill of £200?</p> <p><math>\frac{1}{2} + \frac{1}{3} = ?</math>, <math>\frac{3}{8} \times \frac{1}{3} = ?</math>, <math>\frac{1}{2} \div \frac{1}{8} = ?</math></p>																		
(5)	<p><b>12. NUMBER PATTERNS and SEQUENCES</b></p> <p>R: Simple number patterns</p> <p><b>C: Recognise and continue number patterns</b></p> <p><b>Construct number patterns</b></p> <p><i>E: Find formula for the <math>n</math>th term of a linear sequence.</i></p>	<p>Odd / even / multiple</p> <p>Explain the patterns in words</p>	<p>1, 3, 5, 7, ..., ... ; 3, 6, 9, 12, ..., ...</p> <p>Fibonacci – 1, 1, 2, 3, 5, ..., ...</p> <p>1, 4, 7, 10, ..., ...</p> <p>For sequence <math>\triangle, \nabla, \triangle\nabla, \dots</math>, the number of sides is 3, 5, 7, ..., .... How many sides in the 100th member?</p> <p><math>n</math>th term in sequence 8, 11, 14, 17, ..., ..., ...</p>																		
(7)	<p><b>13. GRAPHS</b></p> <p>R: Coordinates</p> <p><b>C: Coordinates</b></p> <p><b>Plotting straight lines and curves given values</b></p>	<p>First quadrant only</p> <p>4 quadrants; directed numbers</p>	<p>Plot the points (3,2), (4,0) and (0,1).</p> <p>Identify coordinates of points in <math>xy</math>-plane</p> <p>Plot graph for values</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border-right: 1px solid black; padding: 0 5px;"><math>x</math></td> <td style="padding: 0 5px;">-3</td> <td style="padding: 0 5px;">-2</td> <td style="padding: 0 5px;">-1</td> <td style="padding: 0 5px;">0</td> <td style="padding: 0 5px;">1</td> <td style="padding: 0 5px;">2</td> <td style="padding: 0 5px;">3</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 0 5px;"><math>y</math></td> <td style="padding: 0 5px;">9</td> <td style="padding: 0 5px;">4</td> <td style="padding: 0 5px;">1</td> <td style="padding: 0 5px;">0</td> <td style="padding: 0 5px;">1</td> <td style="padding: 0 5px;">4</td> <td style="padding: 0 5px;">9</td> </tr> </table>	$x$	-3	-2	-1	0	1	2	3	$y$	9	4	1	0	1	4	9		
$x$	-3	-2	-1	0	1	2	3														
$y$	9	4	1	0	1	4	9														



Hrs	Topic	Notes	Examples	References	Page
	<p>* <i>E: Graphs in context, including conversion and travel graphs (<math>s - t</math> and <math>v - t</math>) and an understanding of speed as a compound unit</i></p> <p><i>Scatter graphs and lines of best fit</i></p>	<p>Draw and interpret Gradient and area under graph for <b>polygon</b> graphs only</p>	<p>Calculate speed between A and B from graph.</p>  <p>Distance Time</p> <p>Name the type of correlations illustrated below.</p> <p>(a)  (b) </p>		
(8)	<p><b>14. LOCI and TRANSFORMATIONS</b></p> <p>R: Line and rotational symmetry Drawing shapes to correct size</p> <p>C: <b>Scale drawings</b> <b>Construction using protractor and compasses</b> <b>Simple enlargements and reflections</b></p> <p><i>E: Construction of loci</i></p> <p><i>Enlargement</i></p> <p><i>Reflections</i></p>	<p>Notation 1 : 200, etc.</p> <p>Triangle and other shapes</p> <p>Positive integer scale factors for enlargements</p> <p>About point(s) and line(s)</p> <p>Positive integers and simple fractions for scale factor</p> <p>Reflect lines in oblique lines</p>	<p>Find rotational symmetry of </p> <p>Make scale drawing of garden or playground</p> <p>Construct the locus of points equidistant from both lines.</p>  <p>Enlarge diagram by scale factor <math>\frac{1}{3}</math>, centre C.</p>  <p>Reflect these shapes in the given mirror line.</p> <p>(a)  (b) </p>		

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	<p><i>Rotations</i></p> <p><i>Translations</i></p>	<p>Describe the mirror line using simple equations.</p> <p><math>90^\circ</math>, <math>180^\circ</math>, in a given direction about the origin.</p> <p>Find the centre of rotation by inspection</p> <p>Using vector notation*</p>	<p>Equation of mirror line?</p>  <p>Draw image after translation <math>\begin{pmatrix} -3 \\ 2 \end{pmatrix}</math></p> 		
(6)	<p><b>15. VARIATION: RATIO and PROPORTION</b></p> <p>R: Simple ratios</p> <p>Equivalent ratios and fractions</p> <p><b>C: Unitary ratios; direct and inverse proportion</b></p> <p><b>Map scales / ratios</b></p> <p><b>Proportional division</b></p>	<p>Recipes</p> <p>Mixed units</p>	<p>If the teacher/pupil ratio is 1:20, and there are 15 teachers, how many pupils are there?  <math>5:15 \equiv 1:3</math></p> <p>If 5 books cost £15, what is the cost of 8 books?          If 8 people take 3 days to paint some railings, how long would 6 people take?          e.g. 1:20 000; 1 cm to 2 km</p> <p>If the map scale is 1:250 000, what is the actual distance between two churches 3 cm apart on the map?</p> <p>Share £30 in the ratio 2:3.</p>		
(5)	<p><b>16. INEQUALITIES</b></p> <p>R: Simple inequalities using a number line</p>		<p>Mark on a number line <math>x &lt; 5</math>, <math>x \geq 2</math></p>		

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	<p><b>C: Solutions to inequalities on a number line</b></p> <p><i>E: Solution of linear inequalities and simple quadratic inequalities</i></p>	<p>Notation: <math>\leq</math> or <math>\geq</math>, <math>&lt;</math> or <math>&gt;</math>,  <math>\bullet</math> or <math>\circ</math></p>	<p>List whole numbers <math>n</math> which satisfy <math>-4 &lt; n &lt; 2</math></p> <p>List whole numbers <math>n</math> which satisfy</p>  <p>Solve for <math>x</math></p> <p>(a) <math>5x + 2 &lt; x + 16</math>    (b) <math>x^2 \leq 25</math></p>		