

## Year 10 Topic Outline [2019/20]

| Topic                         | Outline of content  | Revision Guide | Workbook       | MathsWatch     |
|-------------------------------|---|----------------|----------------|----------------|
| Number                        | Written methods – column addition and subtraction, long multiplication, bus stop division | Page 3 – 5     | Page 2 – 4     | 17 – 20        |
|                               | Negative numbers  | Page 7         | Page 6         | 23, 68a, 68b   |
|                               | Types of number   | Page 2, 8 – 9  | Page 1, 7 – 8  | 28, 81         |
|                               | Prime factorisation   | Page 9 – 11    | Page 9 – 11    | 78             |
|                               | HCF and LCM   |                |                | 79, 80         |
|                               | Rounding to a given degree of accuracy  | Page 16 – 18   | Page 17 – 19   | 31, 32, 90     |
|                               | Estimation  |                |                | 91             |
|                               | Error intervals   | Page 19        | Page 20        | 155            |
| Statistics                    | Populations and sampling  | Page 114       | Page 106       | 152, 176       |
|                               | Mean, median, mode and range  | Page 116       | Page 108 – 109 | 62             |
|                               | Averages from grouped and ungrouped frequency tables                                      | Page 121 – 122 | Page 115 – 116 | 130a, 130b     |
|                               | Bar charts, pie charts and pictograms   | Page 117 – 119 | Page 110 – 113 | 15, 16, 128a   |
|                               | Scatter graphs – draw and interpret using lines of best fit                               | Page 120       | Page 114       | 129            |
| Expressions and Formulae      | Simplify algebraic expressions – collect like terms, algebraic products                   | Page 25 – 26   | Page 24        | 33 – 35        |
|                               | Expanding single and double brackets  | Page 26 – 27   | Page 25        | 93, 134a, 134b |
|                               | Factorising into single brackets  | Page 28        | Page 26        | 94             |
|                               | BIDMAS (order of operations)  | Page 2         | Page 1         | 75             |
|                               | Substitute into expressions and formulae  | Page 31        | Page 28        | 95             |
|                               | Construct formulae and expressions from real world contexts                               | Page 32 – 33   | Page 29 – 30   | 137            |
| Shape and Pythagoras' Theorem | Area and perimeter of basic shapes (including compound shapes)                            | Page 82        | Page 74 – 76   | 53 – 56        |
|                               | Parts of a circle   | Page 79        | Page 77        | 116            |
|                               | Area and circumference of circles   |                |                | 117, 118       |
|                               | Pythagoras' theorem   | Page 99        | Page 97        | 150a, 150b     |
| Ratio and Proportion          | Simplify ratios   | Page 55        | Page 49        | 38             |
|                               | Dividing amounts into ratios  | Page 57        | Page 50 – 51   | 106            |
|                               | Direct proportion – informal and formal   | Page 58        | Page 52 – 53   | 42             |
|                               | Equivalent fractions, decimals and percentages  | Page 15        | Page 15        | 25, 85, 88, 89 |
|                               | Percentages of amounts  | Page 61 – 64   | Page 55 – 57   | 86, 87         |
|                               | Increasing and decreasing amounts by a percentage   |                |                | 108            |
|                               | Percentage change   |                |                | 109            |
|                               | Simple and compound interest  | Page 62, 65    | Page 58        | 111, 164       |

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| Linear Equations, Inequalities and Formulae | Solve linear equations (including brackets and fractions)  | Page 29        | Page 27        | 135a             |
|   | Solve linear equations - unknown on both sides   |                |                |                  |
|   | Substitute into expressions and formulae   | Page 31        | Page 28        | 95               |
|   | Form and solve equations – from words, diagrams and substituting into formulae                             | Page 31 – 34   | Page 28 – 30   | 137              |
|   | Solve inequalities and show solutions on a number line   | Page 37        | Page 34        | 138, 139         |
|   | Rearrange formulae where the subject appears once  | Page 34        | Page 31        | 136              |
| Fractions and Decimals                      | Written methods involving decimals   | Page 6         | Page 5         | 17, 18, 66, 67   |
|   | Converting between decimals and fractions (including recurring decimals)                                   | Page 15        | Page 15 – 16   | 84, 177          |
|   | Equivalent fractions   | Page 12        | Page 12 – 13   | 25               |
|   | Calculations with fractions (including mixed numbers) – addition, subtraction, division and multiplication | Page 12 – 14   | Page 12 – 14   | 71a, 71b, 73, 74 |
| Indices                                     | Square numbers – know the first 15 square numbers  | Page 2         | Page 1         | 81               |
|   | Cube numbers – know the first 10 cube numbers  |                |                |                  |
|   | Index laws (including negative and fractional powers)  | Page 20        | Page 21        | 131              |
| Volume and Surface Area                     | Surface area of prisms (including cylinders)   | Page 81        | Page 79        | 114a, 114b       |
|   | Volume of prisms (including cylinders)   | Page 82        | Page 81 – 83   | 115, 119         |
|   | Volume of a pyramid – formula given in the exam  | Page 83        | Page 82 - 83   | 170              |
| Probability and Statistical Diagrams        | Bar charts, pie charts and pictograms  | Page 117 – 119 | Page 110 – 113 | 15, 16, 128a     |
|   | Calculate basic probabilities and relative frequencies   | Page 107 – 109 | Page 100       | 14, 59           |
|   | Compare theoretical and experimental probabilities   | Page 109 – 110 | Page 102       | 125              |
|   | Listing outcomes and sample space diagrams (possibility spaces)  | Page 108       | Page 101       | 58, 126          |
|   | Venn diagrams – construct and use to solve problems  | Page 113       | Page 105       | 127a, 127b       |
|   | Frequency trees – construct and use to solve problems  | Page 110       | Page 102       | 57               |
| Constructions, Bearings and Scale Drawings  | Construct triangles – SSS, SAS, ASA  | Page 92 – 95   | Page 91 – 93   | 47, 147          |
|   | Construct an angle bisector and perpendicular bisector of a line   |                |                | 145, 146a, 146b  |
|   | Loci and shading regions   |                |                | 165              |
|   | Bearings and scale drawings  | Page 96 – 98   | Page 94 – 96   | 4, 124           |

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| Standard Form                                   | Multiplying numbers by powers of 10 (recap)  | Page 4          | Page 3       | 30           |
|   | Convert numbers in and out of standard form  | Page 22 – 23    | Page 23      | 83           |
|   | Calculations in standard form  |                 |              |              |
| Angles and Proof                                | Properties of triangles and quadrilaterals   | Page 73         | Page 66 – 67 | 122          |
|   | Finding missing angles using angle rules (including parallel lines)  | Page 88, 90     | Page 85 – 88 | 45, 120, 121 |
|   | Angle proofs   | See class notes |              | -            |
| Quadratics                                      | Expand double brackets (recap)   | Page 27         | Page 25      | 134b         |
|   | Factorise quadratic expressions (including difference of two squares – DOTS)   | Page 38         | Page 26, 35  | 157          |
|   | Solve quadratic equations by factorising   |                 |              |              |
| Plans, Elevations and 3D Shapes                 | Construct plans and elevations (projections) of 3D solids  | Page 85         | Page 84      | 51           |
|   | Represent 3D solids from plans and elevations on isometric paper   | See class notes |              |              |
|   | Solve surface area and volume problems from information provided in plan and elevation diagrams                        | See class notes |              | -            |
| Straight Line Graphs and Simultaneous Equations | Coordinates in all four quadrants  | Page 42         | Page 38      | 8            |
|   | Plot straight line graphs from a table of values   | Page 43 – 44    | Page 39      | 96           |
|   | Straight line graphs – $y = mx + c$  | Page 45 – 46    | Page 40 – 41 | 159a, 159b   |
|   | Plot straight lines given in the form $ay + bx = c$  | Page 46         | Page 39      | 96           |
|   | Solve simultaneous equations graphically   | Page 50         | Page 45      | 140          |
| Compound Measures                               | Use and convert standard units of measurement – length, area, volume/capacity, mass, time money                        | Page 66 – 68    | Page 59 – 62 | 112          |
|   | Use and convert compound units – speed, rates of pay, unit pricing, density, pressure                                  | Page 69 – 70    | Page 63 – 64 | 142          |
| Sequences                                       | Recognise different types of sequences – arithmetic, geometric, quadratic, cubic, triangular, Fibonacci                | See class notes |              | 104, 141     |
|   | Generate sequences from a formula for the nth term   | See class notes | Page 33      | 37, 102      |
|   | Find a formula for the nth term of a linear sequence (including growing geometric designs and problems given in words) | Page 35 – 36    | Page 32 – 33 | 103          |
|   | Find a formula for the nth term of a simple quadratic sequence   | See class notes |              | 213          |

|                                |  |                 |              |     |
|--------------------------------|--|-----------------|--------------|-----|
| Further Equations and Formulae | Solve linear equations – fractions where the unknown is in the denominator     | See class notes |              | -   |
|                                | Form and solve equations – from words, diagrams and substituting into formulae | Page 31 – 34    | Page 28 – 30 | 137 |
|                                | Rearrange formulae where the subject appears more than once.                   | Page 34         | Page 31      | 136 |
| Trigonometry                   | SOH CAH TOA  | Page 101 – 102  | Page 98      | 168 |
|                                | Exact values (non – calculator)  | Page 103        |              | 173 |