

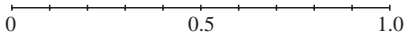
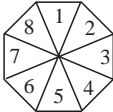
Unit	Notes	Examples
<p>1 <u>BASE ARITHMETIC</u></p> <p>1.1 Binary Numbers</p> <p>1.2 Adding and Subtracting Binary Numbers</p> <p>1.3 Multiplying Binary Numbers</p> <p>1.4 Other Bases</p>	<p>Recap on base 10</p> <p>Powers of 2</p> <p>Expressing numbers in powers of 2</p> <p>Adding and subtracting without conversion to base 10</p> <p>Multiplying without conversion to base 10</p> <p>Octahedral (base 16)</p> <p>Roman numerals – familiarity with notation, including V, X, L, C, M</p> <p>Advantages / disadvantages of using Roman numerals</p>	<p>Express 7908 in powers of 10.</p> <p>Write: (a) 3 (b) 64 (c) 127 (d) 7908 in binary.</p> <p>What are the binary numbers: (a) 1111 (b) 10000 (c) 100100100 as base 10 numbers?</p> <p>(a) $1111 + 1001 = ?$ (b) $1111 - 1001 = ?$ (c) $10000 - 111 = ?$</p> <p>(a) $111 \times 101 = ?$ (b) $1001 \times 1001 = ?$</p> <p>Write: (a) 64 (b) 1 000 000 in base 16.</p> <p>What is LX \times C in Roman numerals?</p>

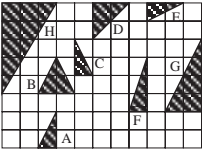
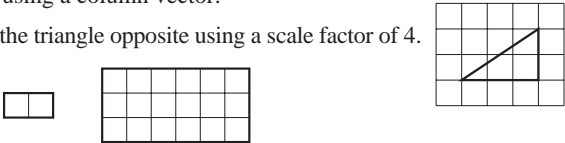

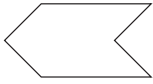

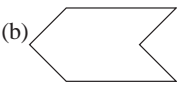
Unit	Notes	Examples
<p>2 BASIC OPERATIONS</p> <p>2.1 Place Value</p> <p>2.2 Addition and Subtraction</p> <p>2.2 Multiplication and Division</p> <p>2.3 Problems in Context</p>	<p>Recap concept of place value</p> <p>Reference to number line, for negative numbers</p> <p>Whole numbers; decimals</p> <p>Mental calculations; using a calculator</p> <p>Whole numbers; decimals</p> <p>Mental calculations; using a calculator</p> <p>Multiplication and division by 10</p> <p>Order of operations (BODMAS)</p> <p>Shopping bills, travel problems, etc.</p>	<p>Put in the correct sign ($<$, $=$, $>$) between these numbers:</p> <p>(a) $3 \dots 5$ (b) $3 \dots -4$ (c) $4 - 2 \dots -2 - (-4)$</p> <p>(d) $7 - 5 \dots 4 - 6$</p> <p>Arrange these numbers in increasing order:</p> <p>-4.2, 0.7, -1.9, 1.3, 2.8, 2.09</p> <p>What is the largest number that you can make using all the digits 2, 7, 5, 1 once and only once?</p> <p>Without using a calculator, what is</p> <p>(a) $152 - 87$ (b) $49 + 123$ (c) $2.7 + 4.9$ (d) $2.15 - 0.89$</p> <p>Calculate: (a) $2.705 + 4.3 + 0.045$ (b) $2.477 - 1.869$ (c) $7.2 - (4.5 - 2.7)$</p> <p>Without using a calculator, what is</p> <p>(a) 9×7 (b) 10×8.76 (c) $4.21 \div 10$ (d) $4.9 \div 0.7$</p> <p>Calculate: (a) 4.7×2.54 (b) $2.85 \div 2.5$</p> <p>Evaluate: (a) $8 \times (2 + 7)$ (b) $(9 -) \div (1 - 4)$</p> <p>A plant grows 12 cm per week for 2 weeks.</p> <p>How many days does it take to reach a height of 0.6 m?</p> <p>What is its height after (a) 1 week, (b) 2 weeks ?</p> <p>How much change from £10 do you get after buying 7 train tickets at £1.25 each?</p> <p>Wire is sold at 49p per metre. What is the cost of 10 m of this wire?</p>

Unit	Notes	Examples
3 INDICES and STANDARD FORM 3.1 Index Notation 3.2 Laws of Indices 3.3 Negative Indices 3.4 Standard Form 3.5 Fractional Indices	Recap notation For positive integers: multiplying and dividing $a^0 = 1$, $a^1 = 1$ and $(a^m)^n = a^{mn}$ Reciprocals Multiplying and dividing by powers of 10 Writing numbers in standard form Convert standard form to decimal numbers Calculations, with or without a calculator Use and understanding of calculator display Unitary fractions only	$2 \times 2 \times 2 \times 2 \times 2 = 2^{\square}$; $81 = 3^{\square}$ $2^3 \times 2^4 = 2^{\square}$ $3^8 \div 3^5 = 3^{\square}$ $m^5 \div m^4 = m^{\square}$ $(x^3)^2 = x^{\square}$ $4^{-2} = ?$; $2^{-3} = ?$; $10^{-2} = ?$ $3.95 \times 100 = ?$; $5120 \div 100 = ?$ $0.7 \times 10^2 = ?$; $8 \div 10^3 = ?$ $4300 = \square \times 10^3$; $5678 = 5.678 \times 10^{\square}$ Write in standard form: (a) 52 (b) 5200 (c) 0.52 Calculate: (a) $(3.4 \times 10^5) \times (2.5 \times 10^3)$ (b) $(3.4 \times 10^5) \div (2.5 \times 10^3)$ (c) $(3.4 \times 10^5) + (2.5 \times 10^3)$ $49^{\frac{1}{2}} = ?$; $8^{\frac{1}{3}} = ?$

Unit	Notes	Examples
<p>4 <u>FRACTIONS and PERCENTAGES</u></p> <p>4.1 Equivalent Fractions</p> <p>4.2 Fractions of Quantities</p> <p>4.3 Operations with Fractions</p> <p>4.4 Fraction, Decimal and Percentage Equivalents</p> <p>4.5 Percentage Increases and Decreases</p>	<p>Identifying equivalent fractions</p> <p>Ordering fractions</p> <p>Numerically and in context</p> <p>Addition and subtraction; same denominator and different denominator</p> <p>Multiplying and dividing</p> <p>Problems in context</p> <p>Conversion and equivalence</p> <p>Finding percentages</p> <p>Calculating percentage increase/decrease</p> <p>Applications</p>	<p>Write these fractions in their simplest form:</p> <p>(a) $\frac{4}{16}$ (b) $\frac{5}{35}$ (c) $\frac{12}{30}$</p> <p>Write these fractions in increasing order:</p> <p>$\frac{1}{2}$, $\frac{2}{5}$, $\frac{4}{9}$, $\frac{3}{8}$, $\frac{2}{3}$</p> <p>What is (a) $\frac{1}{4}$ of 28, (b) $\frac{1}{5}$ of £12 ?</p> <p>(a) $\frac{1}{2} + \frac{3}{8} = ?$ (b) $1\frac{1}{4} - \frac{4}{5} = ?$</p> <p>(a) $4 \times \frac{1}{5} = ?$ (b) $\frac{2}{3} \times \frac{1}{2} = ?$ (c) $5 \div \frac{1}{4} = ?$ (d) $\frac{2}{3} \div \frac{1}{9} = ?$</p> <p>A recipe requires $\frac{3}{4}$ kg of sugar for a cake. How many cakes could be made with $3\frac{3}{4}$ kg of sugar?</p> <p>Write as (a) a fraction (b) a decimal, the percentage</p> <p>(i) 75% (ii) 15% (iii) 12.5%</p> <p>Write as (a) a decimal (b) a percentage, the fraction</p> <p>(i) $\frac{1}{5}$ (ii) $\frac{11}{20}$ (iii) $1\frac{1}{4}$</p> <p>Write as (a) a percentage (b) a fraction, the decimal</p> <p>(i) 0.12 (ii) 0.3 (iii) 2.75</p> <p>What is 15% of £40 ?</p> <p>A coat is decreased in price from £50 by 12%. What is the new price?</p> <p>A bank account pays interest yearly at 5%. How much is an initial investment of £200 worth after 3 years if the interest is added to the account at the end of each year?</p>

Unit	Notes	Examples
<p>5 <u>LINEAR GRAPHS AND EQUATIONS</u></p> <p>5.1 Coordinates</p> <p>5.2 Straight Line Graphs</p> <p>5.3 Linear Equations</p> <p>5.4 Parallel and Perpendicular Lines</p> <p>5.5 Simultaneous Equations</p> <p>5.6 Equations in Context</p>	<p>Recap coordinates in all 4 quadrants</p> <p>Recap concepts from Y8, Unit 14</p> <p>Coordinates: plotting points</p> <p>Drawing graphs of straight lines</p> <p>General equation, $y = mx + c$; interpretation of m and c</p> <p>Recap</p> <p>Graphical illustration</p> <p>Appreciate that $y = mx + c$, for constant m, gives a set of parallel lines</p> <p>Appreciate that $y = -\frac{1}{m}x$ is perpendicular to $y = mx + c$</p> <p>Linear, graphical and analytical approaches</p> <p>Direct proportion</p> <p>Equations resulting from word problems</p>	<div data-bbox="1877 304 2074 496" style="text-align: right;"> </div> <p>Plot the points $(2, -1)$, $(4, 2)$ and $(-3, -2)$ on coordinate axes. What are the coordinates of the points marked on the axes shown?</p> <p>Plot the points $(4, 2)$, $(1, 1)$, $(-5, -1)$ on coordinate axes. Draw the straight line that goes through these points.</p> <p>Draw the graph of $y = 2x + 1$.</p> <p>What is the equation of the line of gradient 2 and intercept with the y-axis -1?</p> <p>Solve for x: (a) $x + 3 = 7$ (b) $2x + 3 = 9$.</p> <p>Solve for x: $2x + 3 = x + 5$</p> <p>Use the graph of $y = 2x + 5$ to solve $2x + 5 = 9$.</p> <p>Which two of these lines are parallel: $y = 5x$, $y = 5x - 2$, $y = 3x - 2$?</p> <p>Give three lines which are parallel to $y = 4 - 2x$ and one line that is perpendicular. Draw graphs of the lines.</p> <p>Solve graphically $2x + 7 = 5$ $x - 4y = 7$ giving your answers to 1 d.p.</p> <p>Check the accuracy of your answers by solving analytically.</p> <p>A removals firm charges £4 per mile with a fixed charge of £25. What distance has been travelled if the bill (excluding VAT) is £93 ?</p>

Unit	Notes	Examples
<p>6 <u>PROBABILITY</u></p> <p>6.1 The Probability Scale</p> <p>6.2 The Probability of a Single Event</p> <p>6.3 The Probability of Two Events</p> <p>6.4 Theoretical and Experimental Probabilities</p>	<p>Number scale 0 - 1</p> <p>Probability scale in words</p> <p>Equally likely events</p> <p>Relative frequency for estimating probabilities</p> <p>Estimating numbers of outcomes</p> <p>Listings, tables, tree diagrams</p> <p>Independent events</p> <p>Comparing experimental values with theoretical values</p>	<p>On the scale  illustrate your estimate of the probability that:</p> <p>(a) it will rain tomorrow, (b) there will be a general election in this country next year, (c) someone in the school will have a birthday tomorrow.</p> <p>A spinner has 8 equally likely outcomes. </p> <p>If the spinner is spun once, what is the probability of obtaining:</p> <p>(a) the number 7, (b) an even number, (c) a prime number ?</p> <p>Estimate the probability of a drawing pin landing tip-up.</p> <p>If you roll a fair dice 30 times, how many 6s do you expect to get?</p> <p>A bag contains 5 RED and 3 BLUE balls. Two balls are picked at random, one at a time, with replacement. What is the probability of obtaining:</p> <p>(a) two RED balls, (b) two balls of different colours?</p> <p>Two fair dice are thrown. What is the probability of obtaining a total of 10 or more?</p> <p>What are the expected frequencies of the totals 2, 3, ... , 12 when two fair dice are thrown 72 times?</p> <p>Perform the experiment and compare the observed values with the expected values.</p>

Unit	Notes	Examples
<p>7 TRANSFORMATIONS</p> <p>7.1 Shapes</p> <p>7.2 Translations</p> <p>7.3 Enlargements</p> <p>7.4 Reflections</p> <p>7.5 Rotations</p> <p>7.6 Combining Transformations</p>	<p>Recap basic definitions of 2-D shapes Similarity and congruence</p> <p>Recap coordinates Translations expressed as column vectors</p> <p>Drawing enlarged shapes (on squared paper) but without using centres of enlargement</p> <p>Enlargement with positive integer scale factor from a given centre of enlargement (with or without shape) including fractional scale factors</p> <p>Finding centre of enlargement and scale factor</p> <p>Line symmetry; simple examples with mirror lines Reflections in $y = 0$, $x = 0$, $y = 2$, etc $x = 3$, etc, $y = x$, $y = -x$</p> <p>Equation of line of reflection for horizontal and vertical mirror lines</p> <p>Rotational symmetry Centre of rotation; 90° and 180° rotation; clockwise and anticlockwise</p> <p>Finding centre of rotation given shape and its transformation</p> <p>2-stage transformations</p>	<p>What is the name of a 2-D shape that has four equal sides?</p> <p>Which of these shapes are (a) congruent, (b) similar?</p>  <p>What effect does the translation $\begin{pmatrix} 1 \\ 5 \end{pmatrix}$ have on the unit square formed by $(0, 0)$, $(0, 1)$, $(1, 1)$, $(1, 0)$?</p> <p>The point $(3, 5)$ moves under a translation to $(1, 7)$. Describe the translation using a column vector.</p> <p>Draw an enlargement of the triangle opposite using a scale factor of 4. What is the scale factor of this enlargement?</p>  <p>The triangle formed by the points $(2, 3)$, $(4, 5)$ and $(6, 9)$ is enlarged, scale factor 2, centre of enlargement at $(0, 0)$. Draw the triangle and its enlargement.</p> <p>Draw all lines of symmetry on these shapes: (a)  (b) </p> <p>Reflect the triangle formed by joining the points $(1, 1)$, $(4, 1)$ and $(1, 2)$, in: (a) x-axis, (b) y-axis, (c) $y = 2$ (d) $y = -x$</p> <p>What is the order of rotational symmetry of these shapes: (a)  (b) </p> <p>Rotate the rectangle formed by joining the points $(1, 1)$, $(3, 1)$, $(3, 2)$ and $(1, 2)$ through 90° anticlockwise about the origin.</p> <p>Reflect shape A in y-axis and rotate new shape by 180° about the origin. What transformation is now needed to return to A?</p> 