

# UNDERSTANDING MATHEMATICS

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123

Numbers

(or Constant Nos)

8) Surds

7) Fractional Powers

6) Negative Powers

5) Power Rules

4) HCF & LCM

3) Prime Factorisation

2) Roots  $\sqrt{\phantom{x}}$

1) Powers  $x^2, x^3$

b) Powers

15) BIDMAS

14) whole no  $\div$  digit

13) x whole nos

12) digit x whole no

11) – whole nos

10) + whole nos

9) Rounding

8) 10s,100s,1000s...

7) x &  $\div$  digits

6) Counting 2s, 3s, 4s & 5s

5) – a digit

4) + a digit

3) + up to 10

2) count past 1,000

1) count to 20 (+1)

a) + - x  $\div$

Whole Numbers

15) x &  $\div$  Mixed Nos

14) + & - Mixed Nos

13)  $\div$  by a Proper Fraction

12)  $\div$  by a Unit Fraction

11) + & - Fractions (Different Bottoms)

10) Equivalent Fract

9) x Proper Fractions

8) x Unit Fractions

7) Proper Fractions of Amounts

6) Unit Fractions of Amounts

5) – Fractions (Same Bottoms)

4) + Fractions (Same Bottoms)

3) Mixed Nos (Improper)

2) Proper Fractions

1) Unit Fractions

c) Fractions

14) Recurring Decimals

13) + - x  $\div$  with Standard Form

12) Standard Form

11) Bounds on Calculations

10) Bounds on Rounding

9) Decimals to Fractions

8) x Decimals

7) Rounding (to sf) & Estimation

6) Rounding (to dp)

5) + & - Decimals

4) Decimals to %

3) x &  $\div$  by 10, 100 & 1,000

2)  $\frac{1}{10}, \frac{1}{100}, \text{ \& } \frac{1}{1,000}$

1)  $\frac{1}{10}$  (Tenths)

d) Decimals

6) Original Amount after % Inc or Dec

5) Repeated % Increase & Decrease

4) % Increase & Decrease

3) % of an Amount using Decimals

2) % of an Amount using Fractions

1) % as Fractions over 100

e) %

4) Quadratic or Cubic Proportionality

3) Inverse Proportionality

2) Proportional Growth  $y \propto x$

1) Unitary Method

g) Proportion

4) Sharing in a Given Ratio

3) Ratios to Fractions & Decimals

2) Equivalent Ratios

1) Stating a Ratio

f) Ratio

5)  $\div$  Complex Nos

4) x Complex Nos

3) + & - Complex Nos

2) Complex Nos

1) i &  $\sqrt{\text{Neg Nos}}$

i) Imaginary Nos

5)  $\div$  Negs

4) x Negs

3) + & - Negs

2) + & - on a Number Line

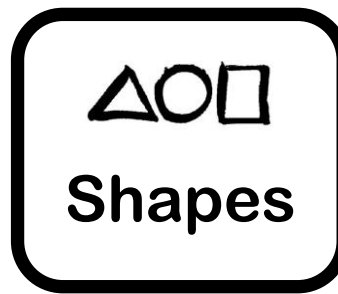
1) Ordering Neg Nos

h) Negative Nos

← Whole Numbers →

← Parts of Whole Numbers →

← All the Parts of a Whole →



16) Volume & Surface Area  
of a Cone & Pyramid

15) Volume & Surface Area  
of a Sphere

14) Sectors & Segments  
of a Circle

13) Units of Length  
Area & Volume

12) Volume of a Prism

11) Surface Area

10) Circumference  
& Area of a Circle

9) Capacity

8) Volume of a Cuboid

7) Area of Polygons

6) Area of a Rectangle

5) Imperial Lengths

4) Metric Length  
Conversions

3) Perimeter

2) Metric Length Units

1) Comparing Lengths

j)  
Size

15) Sin, Cos  
& Area Rules

14) Trig Graphs

13) Circle Theorems

12) 3D Pythag  
& Trig

11) Trigonometry

10) Pythagoras

9) Parallel Line  
Rules (X, F & Z)

8) Angle Sum Rules

7) 3D Shapes

6) Polygon  
Types

5) Quadrilateral  
Types

4) Triangle  
Types

3) Angle  
Types

2) Angles as Turn

1) Basic Shapes  
(Sketch)

k)  
Angles

10) Loci

9) Constructing Line  
(Perpendicular) &  
Angle Bisectors

8) Constructing Nets  
of 3D Shapes

7) Maps: Scales, Grid  
References & Bearings

6) Plans & Elevations

5) Scale Drawings

4) Constructing  
Triangles

3) Constructing  
Circles

2) Measuring &  
Constructing Angles

1) Measuring &  
Constructing Lines

m)  
Constructions

9) Acceleration &  
Speed-Time Graphs

8) Speed &  
Distance-Time Graphs

7) Density

6) Imperial Mass

5) Metric Mass  
Conversions

4) Metric Mass Units

3) Ordering by Mass

2) Dates

1) Time

n)  
Time, Mass  
& Travel

15) + - & x with Vectors

14) Length, Area &  
Volume Scale Factors

13) Similarity &  
Congruence

12) Combined  
Transformations

11) Enlargement with Neg  
& Fractional Scale Factors

10) Rotation from a Centre

9) Enlargement from a  
Centre

8) Translations  
as Vectors

7) Enlargement

6) Reflections on Squared  
Paper

5) Rotational Symmetry

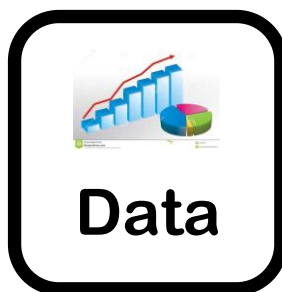
4) Reflectional Symmetry

3) The  
Transformation  
TRRE

2) Home & Street  
Directions

1) Left & Right

p)  
TRRE



## Data

7) Tree Diagrams of Dependent Events

6) Tree Diagrams of Independent Events

5) Sample Space Diagrams

4) Sum of Probs of all Possible Outcomes is 1

3) Experimental Probability

2) Probability of an Event;  $-P(\text{Event})$

1) The Probability Scale

r)  
Probability

8)  $+ - \times \div$   
Algebraic Fractions

7) Simplify Quadratic Algebraic Fractions

6) Completing the Square

5) Factorise Quads ( $a \neq 1$ )

4) Factorise Quads ( $a = 1$ )

3) Factorise into 1 Linear Bracket

2)  $x$  out of 2 or more Linear Brackets

1)  $x$  out of 1 Linear Bracket

t)  
Brackets

4) Collecting Like Terms

3) Substitution into a Quadratic Expressions

2) Substitution into a Linear Expression

1) Term Names

s)  
Expressions

14) Solving Quads by Completing the Sqr

13) Solving Quads with the Quad Eqns Formula

12) Solving Quads ( $a \neq 1$ )

11) Solving Quads ( $a = 1$ )

10) Solving Simultaneous Eqns

9) Solving Linear Eqns with Fractions

8) Solving Eqns by Trial & Improvement with Decimals

7) Inequalities

6) Changing the Subject of a Formula

5) Formulae

4) Solving Eqns with Variables Both Sides

3) Solving Eqns with Inverses

2) Solving Eqns by Trial & Improvement with Whole Nos

1) True Eqns

u)  
Equations

17) Transformations of Graphs

16) Sketching Quads by Completing the Square

15) Sketching Quads ( $a \neq 1$ )

14) 3D Coordinates

13) Perpendicular Lines

12) Graph Shape Types

11) Regions with Inequalities

10) Sketching Quads ( $a = 1$ )

9) Plotting Quads

8) 2D Midpoints & Distances

7) Plotting Linear Graphs with  $y = mx + c$

6) Measuring Gradient  $m$

5) Plotting Linear Graphs -ve Coords

4) Plotting Linear Graphs +ve Coords

3) Horizontal & Vertical Linear Graphs

2) Plotting -ve Coords

1) Plotting +ve Coords

v)  
Graphs



## Variables

(or Algebra)

6) Expressions from Quadratic Sequences ( $b \neq 0$ )

5) Expressions from Quadratic Sequences ( $b = 0$ )

4) Expressions from Linear Sequences

3) Sequences from Contexts

2) Sequences from Expressions

1) Linear Sequences (Terms & Common Difference)

w)  
Sequences

17) Histograms

16) Moving Averages

15) Cumulative Frequency & IQR

14) Estimating Mean from Grouped Data

13) Predications from Scatter Diagrams

12) Scatter Diagrams & Correlation

11) Stratified Sampling

10) Pie Charts

9) Averages & Range

8) Stem & Leaf Diagrams

7) Bar Charts

6) Pictograms

5) Ranking from Pie Charts

4) Random Sampling

3) Questionnaires

2) Tallying

1) Sorting into Types

q)  
Representing Data