Number

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State the order in which mathematical **operations** should be carried out.

1

Number

Order of operations:

Brackets

Indices (powers)

Division

Multiplication

Addition

Subtraction

1

Number

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When multiplying or dividing with two **negative numbers**, the result is always a **positive number**. True or false?

2

Number

True.

When multiplying or dividing with two **negative numbers**, the result is always a **positive number**.

When multiplying or dividing with one negative number and one positive number, the result is always negative.

2

Number

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What is the term used to describe numbers written in the form $A \times 10^n$, where $1 \leqslant A < 10$ and n is a whole number?

3

Number

Numbers written in the form $A \times 10^n$, where $1 \leqslant A < 10$ and n is a whole number, are in **standard form**.

3

Number

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How do you find the **lowest common multiple (LCM)** of two numbers?

4

Number

To find the **lowest common multiple (LCM)** of two numbers:

- List the multiples of the two numbers
- Look for the lowest number that appears in both lists.

4

Basic Algebra

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Are x, x^2 and x^3 **like terms**?

5

Basic Algebra

No, x, x^2 and x^3 are not **like terms**. When simplifying expressions, different powers of x should be collected together separately, e.g. $2x$ and $5x$ are like terms, and x^2 and $3x^2$ are like terms.

5

Basic Algebra

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What is **factorisation**?

6

Basic Algebra

Factorisation is when brackets are introduced to an expression by taking out a common factor or factors.

6

Factorisation and Formulae

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What does it mean if you are asked to change the **subject** of a **formula**?

7

Factorisation and Formulae

The **subject** of a **formula** is the variable that appears on its own (usually on the left-hand side of the = sign). To change the subject, you rearrange the formula so that a different variable appears on its own.

7

Ratio and Proportion

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What does it mean if two quantities are in **direct proportion**?

8

Ratio and Proportion

If two quantities are in **direct proportion**, their ratio remains the same as they are increased or decreased.

8

Variation and Compound Measures

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What is the formula for calculating **speed**?

9

Variation and Compound Measures

The formula for calculating **speed** is:

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

9

Variation and Compound Measures

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What is the formula for calculating how money earning **compound interest** grows over time?

10

Variation and Compound Measures

The formula for calculating how money earning **compound interest** grows over time is:

$$A = \text{Original Amount} \times \left(1 + \frac{\text{Rate}}{100}\right)^{\text{Time}}$$

10

Angles and Shapes

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Vertically opposite angles at a point add up to 180°. True or false?

11

Angles and Shapes

False.

Vertically opposite angles at a point are equal.

The statement would only be correct if there were four right-angles at a point.

11

Angles and Shapes

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What formula can be used to calculate the size of each **exterior angle** of a **regular polygon**?

12

Angles and Shapes

The formula that can be used to calculate the size of each **exterior angle** of a **regular polygon** is:

Exterior Angle = 360° ÷ n, where n is the number of sides.

12

Fractions

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What is a **rational number**?

13

Fractions

A **rational number** is a number that can be written exactly as a fraction or decimal, e.g. $\frac{1}{3}$ is a recurring decimal but it can be written as a fraction, so it is rational.

13

Percentages

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How do you change a **percentage** into an equivalent fraction or decimal?

14

Percentages

To change a **percentage** into an equivalent fraction or decimal, divide by 100, e.g. 35% = $\frac{35}{100}$ = 0.35

14

Percentages

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If a quantity is increased by 5%, what is the decimal **multiplier** that you would use to find the new amount?

15

Percentages

If a quantity is increased by 5%, the new amount is 105%, so the decimal **multiplier** used is 1.05

15

Probability

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What does it mean if an event is **biased**?

16

Probability

If an event is **biased**, the probabilities of the different outcomes are **not** equal, i.e. one outcome is more likely than the others.

16

Probability

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What does it mean if two events are **independent**?

17

Probability

If two events are **independent**, the outcome of one event does **not** depend on the outcome of the other.

17

Number Patterns and Sequences

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What is the difference between an **arithmetic sequence** of numbers and a **geometric sequence**?

18

Number Patterns and Sequences

An **arithmetic sequence** is generated by adding or subtracting the same number each time.

A **geometric sequence** is generated by multiplying or dividing by the same number each time.

18

Number Patterns and Sequences

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Each term in this **sequence** is found by adding the two previous terms together:

1, 1, 2, 3, 5, 8, 13, 21 …

What is the name given to this sequence?

19

Number Patterns and Sequences

The **Fibonacci sequence** is the name given to the sequence starting with 1, 1…, where each term is found by adding together the two previous terms.

19

Transformations

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List the types of **transformation** that produce a shape that is **congruent** to the original shape.

20

Transformations

The shapes produced by **reflections**, **rotations** and **translations** are all **congruent** to the original shape.

In enlargements, the shape produced is similar to the original shape.

20

Constructions

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What is a **bisector**?

21

Constructions

A **bisector** is a line that divides a line, angle or shape exactly in half.

21

Nets, Plans and Elevations

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What is the difference between the **plan view** and an **elevation** of a 3D shape?

22

Nets, Plans and Elevations

A **plan view** of a 3D shape shows what it looks like from above.

An **elevation** shows what it looks like from the front or the side.

22

Linear Graphs

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In the equation of a **linear graph**, $y = mx + c$, which letters represent the **gradient** and the **intercept**?

23

Linear Graphs

In the equation of a **linear graph**, $y = mx + c$, m is the **gradient** and c is the **intercept**.

23

Graphs of Quadratic Functions

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All **quadratic graphs** have **roots**. True or false?

24

Graphs of Quadratic Functions

False.

The **roots** of a **quadratic graph** are the points where the graph crosses the x-axis.

Not all graphs cross the x-axis.

24

Powers, Roots and Indices

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What is $3^2 \times 3^3 \times 3^4$ as a single **power** of 3?

25

Powers, Roots and Indices

$3^2 \times 3^3 \times 3^4 = 3^9$ as a single **power** of 3.

When **multiplying powers** of the same number, you add the indices together, i.e.

$3^2 \times 3^3 \times 3^4 = 3^{2+3+4} = 3^9$

25

Area and Volume

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What is the formula for calculating the **area of a triangle**?

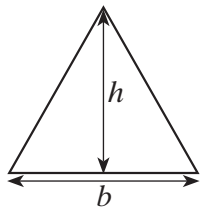
26

Area and Volume

The formula for calculating the **area of a triangle** is:

Area = $\frac{1}{2}$ × Base × Height

$A = \frac{1}{2}bh$



26

Area and Volume

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What is the formula for calculating the **volume of a prism**?

27

Area and Volume

The formula for calculating the **volume of a prism** is:

V = Area of Cross-Section × Length

27

Area and Volume

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What is a **frustum**?

28

Area and Volume

A **frustum** is the 3D shape that remains when a cone or pyramid is cut parallel to its base and the upper part of the shape is removed.

28

Uses of Graphs

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If a line has a **gradient** of +5, what is the gradient of any line **parallel** to it?

29

Uses of Graphs

If a line has a gradient of +5, the **gradient** of any line **parallel** to it is also +5.

29

Other Graphs

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How do you work out the total distance travelled from a **velocity–time** graph?

30

Other Graphs

The total distance travelled is equal to the area under a **velocity–time** graph. So, to work out the total distance, you break down the area under the graph into shapes and calculate the sum of all their areas.

30

Inequalities

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What does the **inequality** symbol $\geqslant$ mean?

31

Inequalities

The **inequality** symbol $\geqslant$ means 'greater than or equal to'.

31

Congruence and Geometrical Problems

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What are the four criteria that can be used to prove that two triangles are **congruent**?

32

Congruence and Geometrical Problems

The four criteria, which can be used to prove that two triangles are **congruent**, are:

- SSS (side, side, side)
- SAS (side, angle, side)
- ASA (angle, side, angle)
- RHS (right-angle, hypotenuse, side).

32

Right-Angled Triangles

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In a right-angled triangle, which side is the **hypotenuse**?

33

Right-Angled Triangles

In a right-angled triangle, the **hypotenuse** is the longest side, opposite the right-angle.

33

Right-Angled Triangles

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How are the three **trigonometric ratios** calculated?

34

Right-Angled Triangles

The three **trigonometric ratios** are calculated as:

$$\sin\theta = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

$$\cos\theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

$$\tan\theta = \frac{\text{Opposite}}{\text{Adjacent}}$$

This can be remembered as SOH CAH TOA.

34

Statistics

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What is the difference between **discrete** and **continuous** data?

35

Statistics

Discrete data can only take certain values in a given range, e.g. number of cars.

Continuous data can take any value in a given range, e.g. distance travelled by cars.

35

Statistics

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You are told that a scatter graph shows a **positive correlation** between two variables.

What does this mean?

36

Statistics

If there is a **positive correlation** between two variables, as one variable increases, the other variable also increases.

36

Measures, Accuracy and Finance

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What is 0.012 345 written to 3 **significant figures**?

37

Measures, Accuracy and Finance

0.012 345 is 0.0123 written to 3 **significant figures**.

The first significant figure is the first non-zero figure.

37

Quadratic and Simultaneous Equations

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Where on a graph can the approximate solutions to a **quadratic equation** be found?

38

Quadratic and Simultaneous Equations

The approximate solutions to a **quadratic equation** are given by the x-coordinates of the points where the graph crosses the x-axis, i.e. the roots.

38

Circles

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What is the formula for calculating the **circumference of a circle**?

39

Circles

The formula for calculating the **circumference of a circle** is:

Circumference = $\pi \times$ Diameter

$(C = \pi d)$

OR

Circumference = $2 \times \pi \times$ Radius

$(C = 2\pi r)$

39

Vectors

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How do you write the **magnitude** of vector **a**?

40

Vectors

The **magnitude** of vector **a** is written as $|\mathbf{a}|$.

40