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

1. **Order of operations:**
   - Brackets
   - Indices (powers)
   - Division
   - Multiplication
   - Addition
   - Subtraction

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

2. **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.

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

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

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

4. **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.

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

5. **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.
What is factorisation?

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

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

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.

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

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

What is the formula for calculating speed?

The formula for calculating speed is:

\[ \text{Speed} = \frac{\text{Distance}}{\text{Time}} \]

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

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

\[ A = \text{Original Amount} \times \left(1 + \frac{\text{Rate}}{100}\right)^{\text{Time}} \]
Vertically opposite angles at a point add up to 180°. True or false?

False. Vertically opposite angles at a point are equal. The statement would only be correct if there were four right-angles at a point.

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

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

\[
\text{Exterior Angle} = \frac{360°}{n},
\]

where \(n\) is the number of sides.

What is a rational number?

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.

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

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

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

If a quantity is increased by 5%, the new amount is 105%, so the decimal multiplier used is 1.05
What does it mean if an event is biased?

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

What does it mean if two events are independent?

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

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

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.

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?

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.

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

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.
What is a **bisector**?

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

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

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.

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

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

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

False. The **roots** of a **quadratic graph** are the points where the graph crosses the \( x \)-axis. Not all graphs cross the \( x \)-axis.

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

\[ 3^2 \times 3^3 \times 3^4 = 3^{2+3+4} = 3^9 \]

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

\[ 3^2 \times 3^3 \times 3^4 = 3^{2+3+4} = 3^9 \]
The formula for calculating the area of a triangle is:

\[ A = \frac{1}{2} \times \text{Base} \times \text{Height} \]

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.

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

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.
The inequality symbol $\geq$ means ‘greater than or equal to’.

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).

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

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.

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.
You are told that a scatter graph shows a **positive correlation** between two variables. What does this mean?

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

What is 0.012345 written to 3 **significant figures**?

0.012345 is 0.0123 written to 3 **significant figures**.
The first significant figure is the first non-zero figure.

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

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.

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

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

- $C = \pi \times \text{Diameter}$
- OR
- $C = 2 \times \pi \times \text{Radius}$

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

The **magnitude** of vector $a$ is written as $|a|$. 