Kemnal Technology College

Year 10 Term 1 - Kemnal Keys

ambitious minds

Ratio

1. **Simplify a ratio** by finding highest common factor
   48 : 12 → 24 : 6 → 12 : 3 → 4 : 1

Sometimes you need to multiply
   7.5 : 3 → 15 : 6

2. **Share an amount in a given ratio:**
   Share £56 in the ratio 3: 5
- Add the ratio parts together (3+5=8)
- Divide the amount by your answer (56 ÷ 8 = 7)
- Multiply each ratio part by your answer (3 x 7 = 21 and 5 x 7 = 35)

   Answer £21: £35

3. **Express a ratio in the form n : 1 or 1 : n.** This means making one part of the ratio equal to 1 (by dividing or multiplying.
- Express 25: 75 in the form 1: n. Divide by 25 → 1 : 3
- Express 7: 2 in the form n: 1. Divide by 2 → 3.5 : 1
- Express 5: 0.25 in the form n: 1. Multiply by 4 → 20 : 1

Probability

1. **Probability** is the likelihood/chance of something happening. It is expressed as a number between 0 (impossible) and 1 (certain); as a fraction, decimal, percentage or in words (likely, unlikely, even chance etc.)
2. **Mutually exclusive** events cannot happen at the same time. E.g. Turning left and right. Heads and Tails on a coin.
3. ***Venn Diagram:*** *shows the relationship between a group of different things and how they overlap.*
4. ***Two-way tables:*** *A table that organises data around two categories. Fill out the information step by step using the information given. Make sure all the totals add up for all columns and rows.*

Construction & Loci

1. **Angle bisector** cuts an angle in half

2. **Perpendicular Bisector**: Cuts a line in half and at right angles.
- Angle of 90° → Construct a perpendicular bisector
- Angle of 45° → Bisect the 90 angle
- Angle of 60° → Start to construct an equilateral triangle
- Angle of 30° → Bisect 60 angle

3. **The perpendicular distance** from a point to a line is the shortest distance to that line.

Straight line graphs

1. **Midpoints:** Finding the mid point of a line or data
- **Method 1**: add the x coordinates and divide by 2, add the y coordinates and divide by 2
- **Method 2**: Sketch the line and find the values half way between the two x and two y values.

2. **Straight line graph** is also called a linear graph.
- The general equation of a linear graph is

   y = mx + c

where **m** - is the gradient and **c** - is the y- intercept.

Vectors

1. **Vectors**: A vector can be written in 2 ways:
   a or <u>a</u>
- A vector is a quantity represented by an arrow with both direction and magnitude.

2. **Magnitude** is defined as the length of a vector.

- If two vectors have the same magnitude and direction, they are equal.

3. **Parallel vectors** are multiples of each other.

4. **A scalar** is the number we multiply a vector by.

5. **Collinear vectors** are vectors that are on the same line.
- To show that two vectors are collinear, show that one vector is a multiple of the other (parallel) AND that both vectors share a point.

Plotting straight line graphs

1. **Method 1**: Table of Values
Construct a table of values to calculate coordinates.

2. **Method 2**: Gradient-Intercept Method
(use when the equation is in the form **y = mx + c**)
1. Plot the y-intercept
2. Use the gradient, plot a second point.
3. Draw a line through the two points plotted.

3. **Method 3**: Cover-Up Method (use when the equation is in the form **ax + by = c**)
1. Cover the term and solve the resulting equation. Plot this on the
2. Cover the term and solve the resulting equation. Plot this on the
3. Draw a line through the two points Plotted.