Maths AS Level Knowledge Organiser

Autumn 2

Pure 03 - Equations and Inequalities

Explain the differences and similarities of the Elimination and Substitution methods for solving simultaneous equations.

Describe the process for solving an Quadratic Inequality:

How do the solutions for quadratic simultaneous equations differ from linear simultaneous equations?

When drawing regions of inequalities on a graph, what does a dotted line represent? What about a solid line?

Pure 04 - Graphs and Transformations

Define what is meant by a Repeated Root. How does this look on a graph, and how can you recognise it in a function?

A reciprocal function has two sets of asymptotes. Where are they located? Define an asymptote.

What reflective effects does the term negative sign have on these functions?

$y = -f(x)$

$y = f(-x)$

What translational effects does the term a have on these functions?

$y = f(x) + a$

$y = f(x + a)$

What stretching effects does the term a have on these functions?

$y = af(x)$

$y = f(ax)$

Pure 05 - Straight Line Graphs

Define the gradient and state the generalised formula for calculating it:

Describe the two main ways that you can define a straight line:

State the two general forms of linear equation. Define each term:

Explain the conditions required for two lines to be parallel or perpendicular. State the requirements for their gradients in equation form:

Derive the formula for finding the distance between two points:

Pure 07 - Algebraic Methods

Define the term Polynomial:

Describe the Factor Theorem, and explain why it is true and how it can be used:

Explain how a proof of a mathematical statement differs from a Demonstration. Give an example.

List the three main types of proof, and briefly describe them:

Applied 03 - **Representations of Data**

Describe what an Outlier is, and describe how you determine if a value is an Outlier in a data set.

Define Frequency Density and state how is can be calculated.

Explain the process required to turn a histogram into a frequency polygon

Explain what the "Cleaning" of a data set is.

What are the main features that can be commented on when comparing data sets?

Applied 09 - **Constant Acceleration**

Velocity and Acceleration can be defined as rates of change of other quantities. What are these quantities? Draw and annotate a Displacement-Time and a Velocity-Time graph to show this.

State the five core Kinematics equations for constant acceleration.

What do the areas beneath a Displacement-Time and a Velocity-Time graph represent?

State the value of the vertical acceleration that models gravity. What conditions and assumptions are required for this modelled value?