

# YEAR 9 CORE: MATHEMATICS

## Semester 1

Students will solve problems involving simple interest and investigate the use of percentages, ratios and rates in the area of financial mathematics. They will substitute into formulas, find unknown values and manipulate linear algebraic expressions. Whilst investigating these concepts students will become familiar with the correct procedures involved, with and without the use of digital technology. They will investigate distributive law and its application to algebraic expressions as well as numbers. Students will apply Pythagoras' theorem and trigonometric ratios to solve problems involving angles and lengths in right-angled triangles. They will apply the index laws using integer indices to variables and numbers and express numbers in scientific notation.

### **Number and Algebra**

Students will learn to:

- Simplify and evaluate numerical expression, using both positive and negative integer indices.
- Represent large and small numbers in scientific notation and numbers expressed in scientific notation as whole numbers or decimals.
- Understand that financial decisions can be assisted by mathematical calculations.
- Apply set structures to solve real-world problems
- Recognise that the distributive law can be applied to algebraic expressions as well as numbers.
- Solve a wide range of linear equations and check solutions by substitution.

### **Measurement and Geometry**

Students will learn to:

- Investigate Pythagoras' theorem as a useful tool in determining unknown lengths in right-angled triangles and has widespread applications.
- Recognise that right-angled triangle calculations will generate results that can be integers, fractions or irrational numbers.
- Understand the terms 'adjacent' and 'opposite' sides in a right-angled triangle.
- Select and accurately use the correct trigonometric ratio to find unknown sides in right-angled triangles.

## **Semester 2**

Students will use the distributive law to expand algebraic expressions, including binomial expressions, and simplify a range of algebraic expressions. They will find the distance between two points on the Cartesian plane and the gradient and midpoint of a line segment using a range of strategies. Students will sketch and draw linear relations, solve simple related equations and explain the relationship between the graphical and symbolic forms, with and without the use of digital technology. They will calculate relative frequencies to estimate probabilities and list outcomes for two-step experiments and assign probabilities for those outcomes and related events.

### **Number and Algebra**

Students will learn to:

- Investigate the relationship between expansion and factorisation and identify algebraic factors in algebraic expressions.
- Use Pythagoras' theorem to calculate the distance between two points on the Cartesian plane.
- Investigate graphical and algebraic techniques for finding the midpoint of line segments and gradients of straight lines.
- Learn and apply a range of procedures when solving problems involving parallel and perpendicular lines.
- Determine linear rules from suitable diagrams, tables of values and graphs and describe them using both words and algebraic expressions.

### **Statistics and Probability**

Students will learn to:

- Use systematic methods to list outcomes of experiments and list outcomes favourable to an event.
- Compare experiments which differ by being undertaken with replacement or without replacement.
- Use Venn diagrams or two-way tables to calculate relative frequencies of events involving 'and', 'or' outcomes.