

Grade 9 Mathematics Objectives 2011-2012

Unit 1: Square Roots and Surface Area

- 1.1 Determine the square root of positive rational numbers that are perfect squares.
- 1.2 Determine the approximate square root of positive rational numbers that are non-perfect squares.
- 1.3 Determine the surface area of composite 3-D objects to solve problems.

Unit 2 : Powers and Exponent Laws

- 2.1 Demonstrate an understanding of powers with integral bases (excluding base 0) and whole number exponents) by:
 - representing repeated multiplication using powers
 - using patterns to show that a power with an exponent of zero is equal to one
 - solving problems involving powers
- 2.2 Demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole number exponents. (Exponent Rules)
- 2.3 Explain and apply the order of operations including exponents, with and without technology.

Unit 3: Rationale Numbers

- 3.1 Demonstrate an understanding of rational numbers by:
 - comparing and ordering rational numbers.
 - solving problems that involve arithmetic operations on rational numbers.

Unit 4: Linear Relations

- 4.1 Generalize a pattern arising from a problem-solving context using linear equations, and verify by substitution.
- 4.2 Graph linear relations, analyze the graph and interpolate or extrapolate to solve problems.

Unit 5: Polynomials

- 5.1 Demonstrate an understanding of polynomials (limited to polynomials of degree less than or equal to 2).
- 5.2 Model, record and explain the operations of addition and subtraction of polynomial expressions, concretely, pictorially and symbolically (limited to polynomials of degree less than or equal to 2).

5.3 Model, record and explain the operations of multiplication and division of polynomial expressions (limited to polynomials of degree less than or equal to 2). by monomials, concretely, pictorially and symbolically.

Unit 6: Linear Equations

6.1 Model and solve problems, using linear equations of the form: $ax = b$, $\frac{x}{a} = b$, $a \neq 0$, $ax + b = c$, $a \neq 0$, $ax = b + cx$, $a(x + b) = c$, $ax + b = cx + d$, $a(bx + c) = d(ex + f)$, $\frac{ax}{x} = b$, $x \neq 0$ where a, b, c, d, e and f are rational numbers.

6.2 Explain and illustrate strategies to solve single variable linear inequalities with rational number coefficients within a problem-solving context.

Unit 7: Similarity and Transformations

7.1 Demonstrate an understanding of similarity of polygons.

7.2 Draw and interpret scale diagrams of 2-D shapes.

7.3 Demonstrate an understanding of line and rotation symmetry.

Unit 8: Circle Geometry

8.1 Solve problems and justify the solution strategy using circle properties including:

- The perpendicular from the centre of a circle to a chord bisects the chord.
- The measure of the central angle is equal to twice the measure of the inscribed angle subtended on the same arc.
- The inscribed angles subtended by the same arc are congruent.
- A tangent to a circle is perpendicular to the radius at the point of tangency.

Unit 9: Probability and Statistics

9.1 Describe the effect of bias, use of language, ethics, cost, time and timing, privacy and cultural sensitivity on the collection of data.

9.2 Select and defend the choice of using either a population or a sample of a population to answer a question.

9.3 Develop and implement a project plan for the collection, display and analysis of data by:

- formulating a question for investigation
- choosing a data collection method that includes social considerations
- selecting a population or a sample
- collecting the data
- displaying the collected data in an appropriate manner
- drawing conclusions to answer the question.

9.4 Demonstrate an understanding of the role of probability in society.