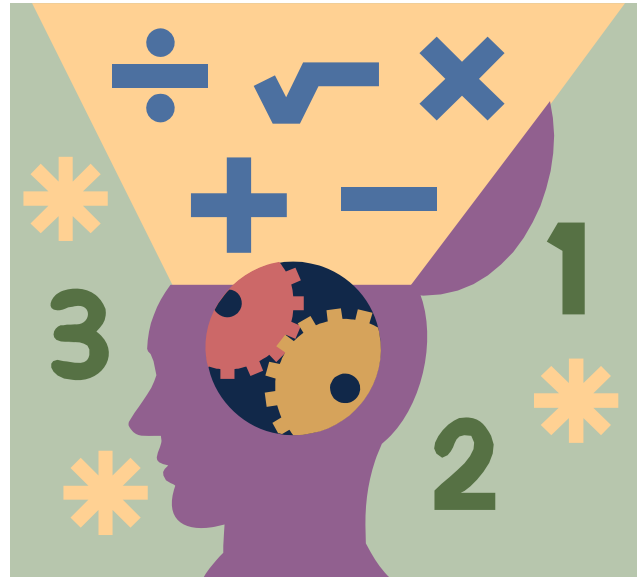


Grade 9 Mathematics

Correlation
between
1996 Curriculum
and
2008 Curriculum



NUMBER

Number

C – Communication
PS – Problem Solving

CN – Connections
R – Reasoning

ME- Mental Mathematics and Estimation
T – Technology V - Visualization

1996 Curriculum	2008 Curriculum
Document and explain calculator keying sequences used to perform calculations involving rational numbers (A-2)	
Give examples of numbers that satisfy the conditions of natural, whole, integral, and rational numbers, and show that these numbers comprise the rational number system (C-1)	
Describe, orally and in writing, whether or not a number is rational (C-2)	9.N.3. Demonstrate an understanding of rational numbers by <ul style="list-style-type: none"> ▪ comparing and ordering rational numbers. ▪ solving problems that involve arithmetic operations on rational numbers [C, CN, PS, R, T, V]
Illustrate power, base, coefficient, and exponent, using rational numbers or variables as bases or coefficients (H-1)	9.N.1. Demonstrate an understanding of powers with integral bases (excluding base 0) and whole- number exponents by <ul style="list-style-type: none"> • 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 [C, CN, ME, PS, R]
Determine the value of powers with (non-negative) integral exponents, using the exponent laws (H-2,H-9)	9.N.1. Demonstrate an understanding of powers with integral bases (excluding base 0) and whole- number exponents by <ul style="list-style-type: none"> • 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 [C, CN, ME, PS, R]
Explain and apply the exponent laws for exponents with integral exponents <ul style="list-style-type: none"> • $x^m \cdot x^n = x^{m+n}$ • $x^m \div x^n = x^{m-n}, x \neq 0$ • $(x^m)^n = x^{mn}$ • $(xy)^m = x^m y^m$ • $\left(\frac{x}{y}\right)^m = \frac{x^m}{y^m}, y \neq 0$ • $x^0 = 1, x \neq 0$ • $x^{-n} = \frac{1}{x^n}, x \neq 0$ (H-3, H-8)	9.N.2. Demonstrate an understanding of operations on powers with integral bases (excluding base 0) and whole-number exponents. [C, CN, ME, PS, R, t]
Understand and use the exponent laws to simplify expressions with variable bases and evaluate expressions with numerical bases (H-11)	
Use a calculator to perform calculations involving scientific notation and exponent laws (H-12)	

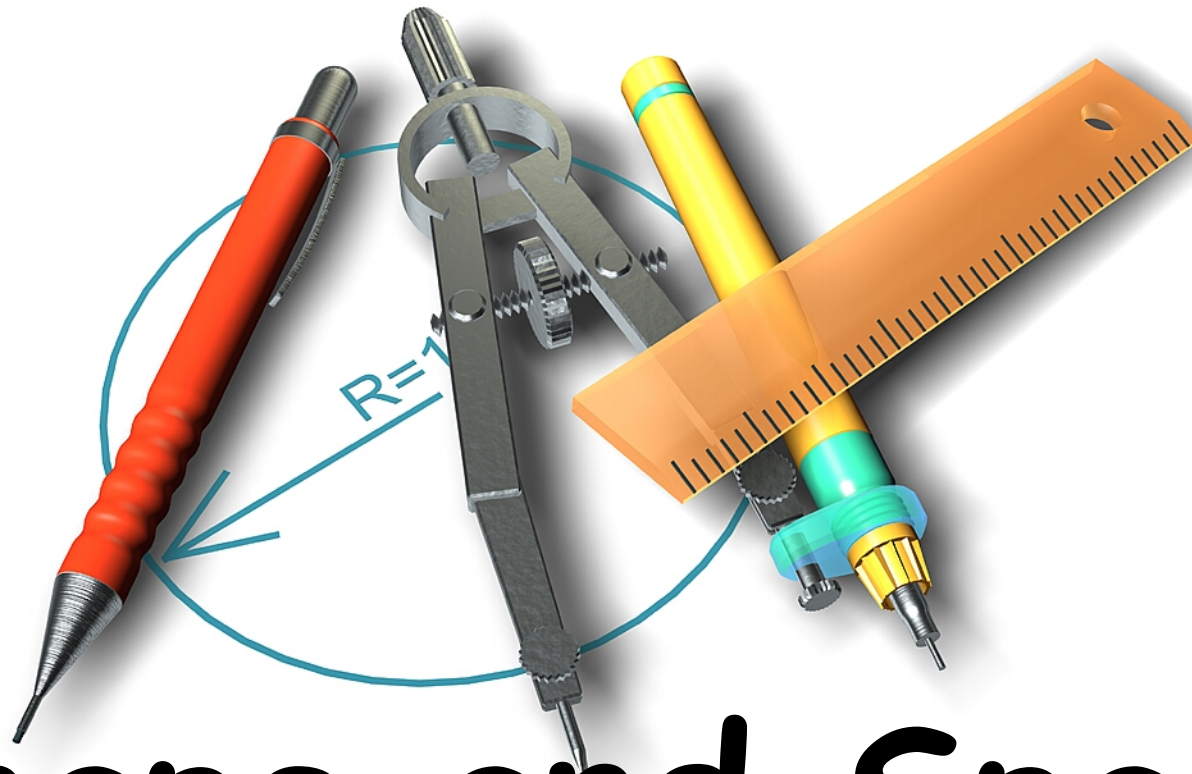
1996 Curriculum	2008 Curriculum
Give examples of situations where answers would involve the positive (principal) square root, or both positive and negative square roots of a number (H-13)	9.N.5. Determine the square root of positive rational numbers that are perfect squares. [C, CN, PS, R, T] 9.N.6. Determine the approximate square root of positive rational numbers that are non-perfect squares. [C, CN, PS, R, T]
Solve problems, using rational numbers in meaningful contexts (J-4)	9.N.3. Demonstrate an understanding of rational numbers by <ul style="list-style-type: none"> ▪ comparing and ordering rational numbers ▪ solving problems that involve arithmetic operations on rational numbers [C, CN, PS, R, T, V]
	9.N.4. Explain and apply the order of operations including exponents, with and without technology. [ME, PS, T]



Patterns and Relations

1996 Curriculum	2006 Curriculum
Use logic and divergent thinking to present mathematical arguments in solving problems (A-1)	
Identify constant terms, coefficients, and variables in polynomial expressions (C-3)	9.PR.5. Demonstrate an understanding of polynomials (limited to polynomials of degree less than or equal to 2). [C, CN, R, V]
Represent and justify the addition and subtraction of polynomial expressions, using concrete materials and diagrams (C-5)	9.PR.6. 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). [C, CN, PS, R, V]
Perform the operations of addition and subtraction on polynomial expressions (C-6)	9.PR.6. 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). [C, CN, PS, R, V]
Represent multiplication of two monomials, and of a monomial and a polynomial, using concrete materials and diagrams (C-7)	9.PR.7. 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. [C, CN, R, V]
Find the product of two monomials, and of a monomial and a polynomial (C-8)	9.PR.7. 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. [C, CN, R, V]
Evaluate polynomial expressions, given the value(s) of the variable(s) (C-10)	
Model situations that can be represented by first-degree equations (C-4)	9.PR.1. Generalize a pattern arising from a problem-solving context using linear equations and verify by substitution. [C, CN, PS, R, V]
Write equivalent forms of algebraic expressions, or equations with rational coefficients (C-9)	
Illustrate the solution process for a first-degree, single-variable equation, using concrete materials or diagrams (E-1)	9.PR.3. Model and solve problems, using linear equations of the form <ul style="list-style-type: none"> • $ax = b$ • $ax + b = c$ • $ax = b + cx$ • $a(x + b) = c$ • $ax + b = cx + d$ • $a(bx + c) = d(ex + f)$ • $\frac{a}{x} = b, x \neq 0$ where a, b, c, d, e and f are rational numbers. [C, CN, ME, PS, V]

1996 Curriculum	2006 Curriculum
<p>Solve and verify first-degree, single-variable equations of forms such as:</p> <ul style="list-style-type: none"> • $ax = b + cx$ • $a(x + b) = c$ • $ax + b = cx + d$ • $a(bx + c) = d(ex + f)$ • $\frac{a}{x} = b, x \neq 0$ <p>where a, b, c, d, e, and f are all rational numbers (with a focus on integers), and use equations of this type to model and solve problem situations (E-2)</p>	<p>9.PR.3. Model and solve problems, using linear equations of the form</p> <ul style="list-style-type: none"> • $ax = b$ • $ax + b = c$ • $ax = b + cx$ • $a(x + b) = c$ • $ax + b = cx + d$ • $a(bx + c) = d(ex + f)$ • $\frac{a}{x} = b, x \neq 0$ <p>where a, b, c, d, e and f are rational numbers. [C, CN, ME, PS, V]</p>
<p>Solve, algebraically, first-degree inequalities with one variable, display the solutions on a number line, and test the solutions (E-3)</p>	<p>9.PR.4. Explain and illustrate strategies to solve single variable linear inequalities with rational number coefficients within a problem-solving context. [C, CN, ME, PS, R, V]</p>
<p>Determine equivalent forms of algebraic expressions by identifying common factors and by factoring trinomials of the form $x^2 + bx + c$ (H-4)</p>	
<p>Represent multiplication, division, and factoring of monomials, binomials and trinomials of the form $x^2 + bx + c$, using concrete materials and diagrams (H-5)</p>	
<p>Find the quotient when a polynomial is divided by a monomial (H-6)</p>	<p>9.PR.7. 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. [C, CN, R, V]</p>
<p>Find the product of two monomials, a monomial and a polynomial and two binomials (H-7)</p>	<p>9.PR.7. 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. [C, CN, R, V]</p>
<p>Evaluate polynomial expressions, given the value(s) of the variable(s) (H-10)</p>	<p>9.PR.2. Graph linear relations, analyze the graph, and interpolate or extrapolate to solve problems. [C, CN, ME, PS, R, T, V]</p>

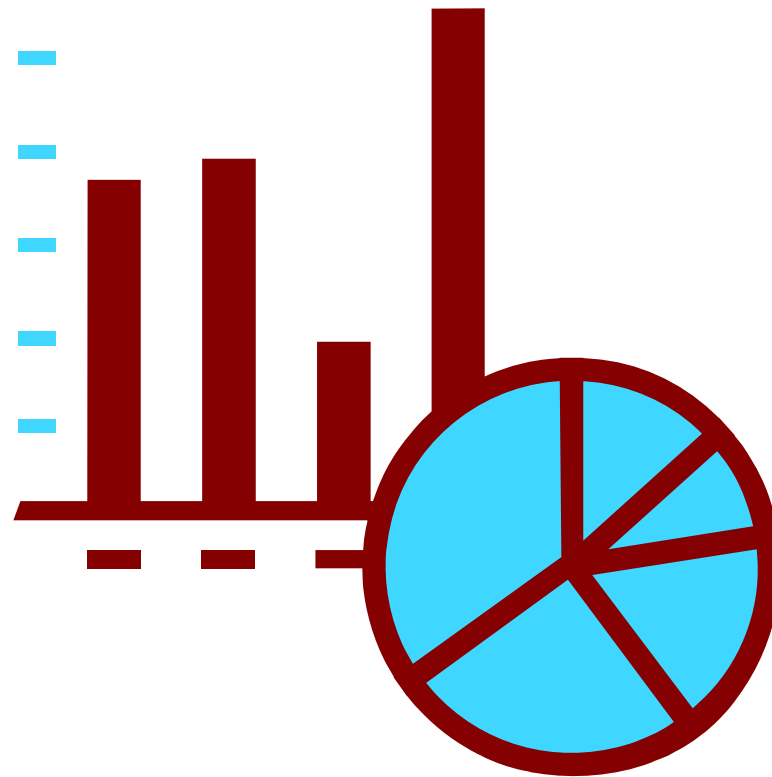


Shape and Space

1996 Curriculum	2006 Curriculum
Recognize and draw the locus (set of points) in solving practical problems (D-1)	
Draw the plan and elevations of a 3-D object from sketches and models (D-2)	
Sketch or build a 3-D object, given its plan and elevation views (D-3)	
Recognize when, and explain why, two triangles are congruent, and use the properties of congruent triangles to solve problems (F-1)	
Recognize when, and explain why, two triangles are similar, and use the properties of congruent triangles to solve problems (F-2)	9.SS.3. Demonstrate an understanding of similarity of polygons. [C, CN, PS, R, V]
Relate congruence to similarity in the context of triangles (F-3)	
Explain the meaning of sine, cosine, and tangent ratios in right triangles (I-1)	
Demonstrate the use of trigonometric ratios (sine, cosine, and tangent) in solving right triangles (I-2)	
Calculate an unknown side or an unknown angle in a right triangle, using appropriate technology (I-3)	
Model and then solve given problem situations involving one right triangle (I-4)	
Calculate area and perimeter to solve design problems in two dimensions (J-1)	
Relate expressions for volumes of pyramids to volumes of prisms, and volume of cones to volume of cylinders (J-2)	
Calculate volume and surface area to solve problems in three dimensions (J-3)	9.SS.2. Determine the surface area of composite 3-D objects to solve problems. [C, CN, ME, PS, R, V]
Draw the image of a 2-D shape as a result of <ul style="list-style-type: none"> • a single transformation • a dilation • a combination of translations and/or reflections (K-1)	
Identify the single transformation that connects a shape with its image (K-2)	
Demonstrate the congruence of a triangle with its <ul style="list-style-type: none"> • translation image • rotation image • reflection image (K-3)	
Demonstrate that a triangle and its dilatation image are similar (K-4)	

1996 Curriculum	2006 Curriculum
	9.SS.1. Solve problems and justify the solution strategy using circle properties including <ul style="list-style-type: none"> ▪ 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 [C, CN, PS, R, T, V]
	9.SS.4. Draw and interpret scale diagrams of 2-D shapes. [CN, R, T, V]
	9.SS.5. Demonstrate an understanding of line and rotation symmetry. [C, CN, PS, V]

Statistics and Probability



1996 Curriculum	2006 Curriculum
Assess the strengths, weaknesses, and biases of samples and data collection methods (B-1)	9.SP.1. Describe the effect of <ul style="list-style-type: none"> • bias • use of language • ethics • cost • time and timing • privacy • cultural sensitivity on the collection of data. [C, CN, R, T] 9.SP.2. Select and defend the choice of using either a population or a sample of a population to answer a question. [C, CN, PS, R]
Critique ways in which statistical information and conclusions are presented by the media and other sources (B-2)	
Create scatterplots for discrete and continuous variables (B-3)	
Interpret a scatterplot to determine if there is an apparent relationship (B-4)	
Determine the line of best fit from a scatterplot for an apparent linear relationship, by <ul style="list-style-type: none"> • inspection • using technology (equations are not expected) (B-5) 	
Draw and justify conclusions from the line of best fit (B-6)	
Design, conduct, and report on an experiment to investigate a relationship between two variables (B-7)	9.SP.3. Develop and implement a project plan for the collection, display, and analysis of data by <ul style="list-style-type: none"> • 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 [C, PS, R, T, V]
Recognize that decisions based on probability may be a combination of theoretical calculations, experimental results, and subjective judgements (G-1)	
Demonstrate an understanding of the role of probability and statistics in society (G-2)	9.SP.4. Demonstrate an understanding of the role of probability in society. [C, CN, R, T]
Solve problems involving the probability of independent events (G-3)	