Grade 9 Math Rubrics

Part A: Number Strand

N9.1a Student demonstrates (concretely, pictorially, and symbolically) an understanding of powers with integral bases (excluding base 0) and whole number exponents.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
Student needs more help with becoming consistent with the criteria.	I can label the base, exponent and power. I can evaluate powers with positive bases with or without technology.	I can show repeated multiplication of a power. I can write as a power of 10. I can evaluate powers (including those with an exponent of 0) with or without technology. I can predict whether the value of a given power will be positive or negative without evaluating. I can determine which of two powers is greater. I can write a number as a power with a given base.	I can analyze the role of brackets in powers. I can explain the difference between the exponent and the base of a power. I can justify why a power with exponent zero is 1. I can explain my strategies for evaluating.

N9.1b Student will understand and apply the exponent laws

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria.	I can write an expression as a single power that involves one step	I can write an expression as a single power that involves multiple laws.	I can apply the order of operations to expressions involving powers. I can explain my strategy. I can perform error analysis. I can show why laws do not apply to sums or differences of powers with the same base.

N9.2a Student demonstrates an understanding of rational numbers including: comparing and ordering.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria.	I can consistently order and compare rational numbers in decimal form	I can consistently order and compare rational numbers in any form. I can consistently determine a rational number between a pair of rational numbers. I can consistently determine equivalent rational numbers. I can consistently place rational numbers on a number line.	I am able to determine the difference between a rational and irrational number and explain my choice. I am able to explain why a group of rational numbers are in order. I am able to explain why a number is between a pair of rational numbers.

N9.2b Student demonstrates an understanding of how to add and subtract rational numbers including those in situational questions.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria	I can consistently add and subtract rational numbers.	I can consistently determine which operation to use in a situational problem that involves addition or subtraction.	I can solve situational questions that involve addition or subtraction of rational numbers. I can interpret my answer to a situational problem. I can perform error analysis. I can explain my strategy for adding or subtracting rational numbers.

N9.2c Student demonstrates an understanding of how to multiply and divide rational numbers including those in situational questions.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria	I can consistently multiply and divide rational numbers.	I can consistently solve situational questions that involved multiplication or division of rational numbers	I can interpret my answer to a situational problem. I can perform error analysis. I can explain my strategy for multiplying or dividing rational numbers

N9.2d Student demonstrates an understanding of how to apply the order of operations to rational numbers including those in situational questions.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria	I can consistently choose and explain the operation that needs to be done first.	I can consistently apply order of operations with rational numbers.	I am able to solve situational questions that involve applying order of operations with rational numbers. I am able to perform error analysis. I am able to explain my strategy for solving with order of operations.

N9.3 Student extends an understanding of square roots to include the square root of positive rational numbers.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria.	I can consistently evaluate square roots of positive rational numbers.	I can consistently: *determine if a rational number is a perfect or non-perfect square root *solve for the missing side in a right triangle using the Pythagorean theorem *demonstrate the relationship between the area and side length of a square *determine the rational number for which a given rational number is its square root * determine a rational number whose square root would be between two given rational numbers	I can solve situational questions. I can determine an estimate of the square root of a non-perfect square. I can perform error analysis. I can explain why a rational number is a perfect or non-perfect square.

Part B: Pattern & Relations Strand

P9.1a Student demonstrates an understanding of linear relations including analyzing, interpolating and extrapolating, solving situational questions.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria.	I can determine if a graph is linear or non-linear and explain why.	I can consistently interpolate and extrapolate to determine a value from a graph of a linear relation.	I am able to verify an interpolated or extrapolated value from a graph. I am able to show understanding of interpolation and extrapolation.

P9.1b Student demonstrates an understanding of linear relations including graphing and solving situational questions.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria.	I can consistently graph a linear relation given the table of values.	I can consistently graph a linear relation and determine what type of line it is.	I can explain my work for graphing linear relations. I can graph a situational question and interpret the results. I can explain why a graph is going to be increasing, decreasing, vertical or horizontal.

P9.2a Model and solve situational questions using linear equations of the form ax = b; x/a = b; ax + b = c; x/a + b = c; where a, b, c, d, e, and f are rational numbers.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria.	I can solve up to three step equations that do not contain fractions or variables in the denominator (other than the basic x/3 + 2 = 5 type of fraction)	I can consistently solve all types of equations with a variable on one side.	I can solve situational questions. I can verify my answers. I can explain my steps. My work is accurate. I can model a linear equation. I can explain each part of the diagram and how it represents the equation.

P9.2b Model and solve situational questions using linear equations of the form; ax = b + cx; a(x + b) = c; ax + b = cx + d; a(bx + c) = d(ex + f); a/x = b where a, b, c, d, e, and f are rational numbers.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria	I can solve up to three step equations that do not contain fractions or variables in the denominator (other than the basic x/3 + 2 = 5 type of fraction)	I can consistently solve all types of equations with variables on both sides.	I can solve situational questions. I can verify my answers. I can explain my steps. My work is accurate. I can model a linear equation. I can explain each part of the diagram and how it represents the equation.

P9.3 Student demonstrates an understanding of single variable linear inequalities with rational coefficients including: solving inequalities; verifying; comparing; graphing

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria.	I can consistently graph a given inequality	I can consistently • solve a linear inequality • write an inequality for a given statement • write an inequality given a graph	I can solve situational questions. I can verify my answer. I can interpret solutions.

P9.4a Student demonstrates an understanding of polynomials (limited to polynomials of degree less than or equal to 2) including: modeling relating to context.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria.	I can consistently: • identify monomials, binomials, trinomials • identify the variable • state the degree • state the number of terms • state the coefficients • state the constant term	I can consistently •write a monomial, binomial or trinomial •compare/write equivalent polynomials	I can describe relationships between a variable in degree 1 and a variable in degree 2. I can analyze polynomials and discuss the significance of parts of the polynomial.

P9.4b Student demonstrates an understanding of polynomials (limited to polynomials of degree less than or equal to 2) including, generalizing strategies for addition and subtraction.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria	I can consistently add polynomials	I can consistently subtract polynomials	I can solve situational questions. I can perform error analysis. I can explain why terms with different variable exponents cannot be added or subtracted.

P9.4c Student demonstrates an understanding of polynomials (limited to polynomials of degree less than or equal to 2) including, multiplication and division.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria	I can multiply a constant by a polynomial. I can divide a polynomial by a constant	I can multiply a monomial by a polynomial. I can divide a polynomial by a monomial.	I can solve situational questions. I can perform error analysis. I can describe relationships between multiplication of a polynomial and a monomial and determining the area of a rectangular region.

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SS9.1a Student demonstrates an understanding of circle properties including: tangents to a circle are perpendicular to the radius ending at the point of tangency.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria.	I can determine the angle measure between a tangent and the radius to the point of tangency.	I can consistently find missing angles and sides in a diagram using the tangent radius angle property.	I can justify why a line is tangent to a circle is tangent to a circle at a specific point.

SS9.1b Student demonstrates an understanding of circle properties including: perpendicular line segments from the centre of a circle to a chord.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria.	I can consistently use the property of a chord to find the length of one side of the chord given either the other side length of the length of the entire chord.	I can consistently solve using the property of chords for missing angles and sides in inscribed triangles.	I can demonstrate my understanding of chord properties by using these to locate the center of a circle. I can consistently extend my knowledge of inscribed right triangles to find additional measurements.

SS9.1c Student demonstrates an understanding of circle properties including: inscribed angles subtended by the same arc have the same measure; the measure of a central angle is twice the measure of an inscribed angle subtending the same arc.

Beginning (1)	Approaching (2)	Proficiency (3)	Mastery (4)
I need more help with becoming consistent with the criteria.	I can consistently identify and find the measure of an inscribed angle and the central angle that subtend the same arc given one of the values.	I can consistently use the property of angles to solve for missing angles and sides.	I can demonstrate and explain the relationship between inscribed angles and the central angle subtended by the same arc.

SS9.2 Student extends an understanding of area to surface area of right rectangular prisms, right cylinders, right triangular prisms, to composite 3d objects.

Beginning 1	Approaching 2	Proficiency 3	Mastery 4
I need more help with becoming consistent with the criteria.	I can consistently determine the surface area of right rectangular, triangular prisms and cylinders with given measurements.	I can consistently determine the surface area of composite 3C objects.	I can solve situational questions involving the surface area of composite 3D objects. I can demonstrate an understanding of surface area of composite 3D objects.

SS9.3 Student demonstrates an understanding of similarity with 2d shapes.

Beginning 1	Approaching 2	Proficiency 3	Mastery 4
I need more help with becoming consistent with the criteria.	I can determine if two shapes are similar. I can draw an enlargement/reduction given a shape and a scale factor.	I can consistently solve for all missing parts of similar 2D shapes. I can determine scale factor. I can draw an enlargement/reduction without a given scale factor. I can explain the difference between similarity and congruence.	I can solve situational questions and demonstrate my understanding involving similarity of 2D shapes.

SS9.4 Student demonstrates an understanding of line and rotation symmetry.

Beginning 1	Approaching 2	Proficiency 3	Mastery 4
I need more help with becoming consistent with the criteria.	I can determine if a diagram has line and/or no rotational symmetry about the center.	I can draw any lines of symmetry and I can state the order of rotation and the angle of rotation about the center of a diagram. I can analyze different transformations and tessellations of 2D shapes to identify any line or rotational symmetry. I can complete a 2-D shape or design given part of a shape or design and one or more lines of symmetry.	I can determine if a picture has line and/or rotational symmetry about a particular point outside the image.

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Part D: Statistics & Probability Strand

SP9.1 Student demonstrates an understanding of the effect of: bias, use of language, ethics, cost, time and timing, privacy, cultural sensitivity, population or sample on data collection.

Beginning 1	Approaching 2	Proficiency 3	Mastery 4
I need more help with becoming consistent with the criteria.	I am able to identify problems with survey questions that have been given to me.	I can discuss the significance of population and sample in situational questions.	I can explain how I considered each part and offer suggestions to improve the validity of the data collection.

SP9.2 Student demonstrates an understanding of the collection, display, and analysis of data through a project.

Beginning 1	Approaching 2	Proficiency 3	Mastery 4
I need more help with becoming consistent with the criteria.	I am able to carry out a collection of data from a survey question. I am able to organize my data and display a visual.	I am able to analyze my data on a superficial level.	I am able to carry out a collection of data from a survey question. I am able to organize my data visually. I am able to analyze my data and make an appropriate conclusion about my results. I can make recommendations due to my analysis. I will be able to assess my project through a rubric I created.

SP9.3 Student demonstrates an understanding of the role of probability in society.

Beginning 1	Approaching 2	Proficiency 3	Mastery 4
I need more help with becoming consistent with the criteria.	I am able to identify experimental, theoretical and subjective probability.	I am able to explain why the person based their prediction on experimental probability, theoretical probability or subjective judgment.	I can analyze the meaningfulness of a probability against the limitations of assumptions associated with that probability. I can provide examples of how a single probability could be used to support opposing positions.

SP9.4 Student researches and presents how first nations and metis people, past and present envision, represent, and make use of probability and statistics.

Beginning 1	Approaching 2	Proficiency 3	Mastery 4
Student needs assistance to research one FN & M group's understanding of statistics & probability but is not able to explain in their own words.	Student is able to find research on one FN & M group's understanding of statistics & probability but is not able to explain in their own words or represent.	Student is able to research and present one First Nation or Metis peoples understanding statistics & probability.	Student is able to research, present, and compare (similarities/differences) between FN & M group and their own understanding of statistics & probability.