

# PreAICE Math 9

## *Expressions Reporting Standard*

PS 1 Use letters to express generalized numbers and express basic arithmetic processes algebraically. Substitute numbers for words and letters in formulae. Transform simple formulae.

PS 2 Identify and use natural numbers, integers, rational and irrational numbers. Use language, notation and Venn Diagrams to describe sets and represent relationships between sets.

PS 3 Expand products of algebraic expressions. Factorize and simplify expressions.

PS 4 Manipulate directed numbers, use brackets and extract common factors. Multiply rational polynomials including use of the binomial theorem.

PS 5 Demonstrate an understanding of the elementary ideas and notation of ratio. Set up and apply direct and inverse proportions.

PS 6 Use the laws of indices to simplify expressions involving indices, including the zero index

## *Equations Reporting Standard*

PS 7 Calculate a given percentage of a quantity. Calculate percentage increase or decrease.

PS 8 Solve simple linear equations in one unknown.

PS 9 Solve quadratic equations by factorization.

PS 10 Solve quadratic equations by completing the square or .

PS 11 Solve quadratic equations by use of the quadratic formula

PS 12 Interpret and obtain the equation of a straight-line graph in the form  $y=mx+c$ . Determine the equation of a straight line parallel to a given line

PS 13 Evaluate fractional indices and solve exponential equations that can be rewritten with equivalent bases

## *Graphing and Systems Reporting Standard*

PS 14 Represent inequalities graphically

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PS 15 Solve simultaneous linear equations in two unknowns.

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PS 16 Find the gradient of a straight-line graph and estimate gradients of curves by drawing tangents; solve associated equations by graphical methods.

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PS 17 Calculate the gradient of a straight line from the co-ordinates of two points on it. Calculate the length and midpoint of a straight-line segment from the co-ordinates of its end points.

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### *Constructions Reporting Standard*

PS 18 Measure lines and angles. Construct a triangle given the three sides using a ruler and pair of compasses only. Construct other simple geometrical figures from given data using protractors and set squares as necessary.

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PS 19 Construct a triangle given the three sides using a ruler and pair of compasses only.

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PS 20 Construct other simple geometrical figures from given data using protractors and set squares as necessary.

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PS 21 Construct angle bisectors and perpendicular bisectors using straight edges and pair of compasses only. Use the following loci and method of intersecting loci for sets of points in two dimensions: from a given distance from a point or line. As well as points which are equidistant from two points or lines.

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PS 22 Recognize that the perpendicular bisector of a chord passes through the center of a circle and solve problems involving the perpendicular bisectors of chords in a circle. Recognize that tangents from an external point of a circle are equal in length and solve problems involving tangents to a circle.

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### *Geometric Properties with Algebra Reporting Standard*

PS 23 Calculate unknown angles at a point and between intersecting lines.

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PS 24 Calculate unknown angles formed within parallel lines and angles in semi-circle or full circle.

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PS 25 Calculate unknown angles using properties of regular and irregular polygons.

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PS 26 Recognize rotational and line symmetry (including order of rotational symmetry) in two dimensions and properties of triangles, quadrilaterals and circles directly related to their symmetries. Recognize symmetry properties of the prism (including cylinder) and the pyramid (including cone). Recognize that equal chords in a circle are equidistant from the center and solve problems involving equal chords.

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PS 27 Recognize that tangents from an external point of a circle are equal in length and solve problems involving tangents to a circle.

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### *Two and Three Dimensional Shapes Reporting Standard*

PS 28 Know, prove and apply basic theorems about similar figures, including scale factors of area and volume.

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PS 29 Use the relationships between areas of similar triangles.

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PS 30 Carry out calculations involving the circumference and area of a circle.

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PS 31 Carry out calculations involving the area of parallelograms and trapeziums

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PS 32 Know, prove and apply basic theorems about similar figures and extension to volumes and surface areas of similar solids.

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PS 33 Solve problems involving the arc length and sector area as fractions of the circumference and area of a circle. Solve problems involving the surface area and volume of a sphere, pyramid and cone

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### *Interpreting Functions Reporting Standard*

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PS 34 Construct tables of values for functions and draw and interpret the graphs of linear.

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PS 35 Construct tables of values for functions and draw and interpret the graphs of quadratic.

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PS 36 Find the partial sums of arithmetic and geometric series and infinite geometric series where appropriate.

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PS 37 Use function notation to describe simple functions, evaluate a function for a given domain.

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PS 38 Construct tables of values for functions and draw and interpret the graphs of quadratic.

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PS 39 Find the partial sums of arithmetic and geometric series and infinite geometric series.

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PS 40 Give appropriate Upper and Lower bounds for data given to a specified accuracy.

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