Daily Challenge with Po-Shen Loh

# Module 4: Algebra Tools

| Course Name | Covered Topics | Learning Time |
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| **Get Ready** | Course Introduction Video, Prerequisite Check, Who Should Take This Course, Help Us Know More about You, How to Use This Course | 10 - 20 mins |
| Day 1 Challenge | Percentage problems; Decimals; Ratios; Difference of squares; Distributive property; Patterns in squares; Exponents; Scientific notation; Estimation; Expressions with two variables; Multiplying binomials; Special numbers | 50 - 60 min |
| Day 2 Challenge | Interpreting word problems using algebraic expressions; Number patterns; Solving linear equations in two variables; Integer equations; Distributive property | 40 - 50 min |
| Day 3 Challenge | Functions; Averages; Applications of variable expressions; Order of operations; Distributive property; Simplifying expressions; Rational functions; Reciprocals; Inverse functions | 40 - 50 min |
| Day 4 Challenge | Sequences; Algebraic methods and Fibonacci sequence; Linear equations in one variable; Rational expressions; Functions; Rational numbers and their decimal representations | 45 - 55 min |
| **Week 1 Challenge** | 40-minute-20 practice problem assessment of Day 1 to Day 4 materials | 60 minutes (up to 4 tries in total) |
| Day 5 Challenge | Arithmetic and geometric sequences and their sums; Averages; Parity; Prime factorization; Divisibility; Negative integers; Sum of powers of 2; Common ratio | 45 - 55 min |
| Day 6 Challenge | Simplifying radicals and rational expressions; Square roots; Nested square root expressions; Multiplying binomials; Nonlinear equations in two variables; Integer expressions; Word problems; Difference of squares; Common denominator | 45 - 55 min |
| Day 7 Challenge | Exponents, multiplying and dividing exponents; $n^{th}$ roots; Derivation of definition of fractional powers; Estimation; Geometric sequences; Common ratio; Derivation of formula for geometric mean | 45 - 55 min |
| Day 8 Challenge | Repeating decimals derived from geometric sequences and fractional form of; Linear equations in one variable; Sum of a convergent geometric sequence | 40 - 50 min |
| **Week 2 Challenge** | 40-minute-20 practice problem assessment of Day 5 to Day 8 materials | 60 minutes (up to 4 tries in total) |
| Day 9 Challenge | Word problems; Systems of linear equations in two variables; Substitution method; Rational equations; Reciprocals; Change of variables; Averages; Number line | 40 - 50 min |
| Day 10 Challenge | Linear equations in three variables; Substitution method; Adding and subtracting equations; Symmetry | 40 - 50 min |
| Day 11 Challenge | Quadratic equations; Factoring methods; Multiplying binomials; Distributive property; Zero Product Rule; Sum and product of the solutions of a quadratic and Viète's Laws; Change of variables; Reciprocals | 50 - 60 min |
| Day 12 Challenge | Derivation of Loh Method of Solving Quadratic Equations and applications to word problems; Roots of an equation; Ratios and proportion; Area; Sum and product of roots of a quadratic; Golden Ratio; Difference of squares | 50 - 60 min |
| **Week 3 Challenge** | 40-minute-20 practice problem assessment of Day 5 to Day 8 materials | 60 minutes (up to 4 tries in total) |
| Day 13 Challenge | Graphing; Definition of axes, origin, and coordinates; Perpendicular angles and bisectors; Rotation; System of linear equations with two variables; Midpoints; Slope-intercept form; Slope of a line; x- and y- intercepts | 50 - 60 min |
| Day 14 Challenge | Graphing; Intersection point of two lines; x- and y-intercepts; Similar triangles; Ratios; Rotations of lines; Systems of equations with two variables; Sum of angles in a triangle; Distance between a point and a line | 40 - 50 min |
| Day 15 Challenge | Right isosceles triangles; Pythagorean Thm; Slope-intercept form of the equation of a line; Coordinates; Distance between two points; Point equidistant from two other points; Perpendicular bisector | 40 - 50 min |
| Day 16 Challenge | Graph of a parabola; Tangent line to a curve; Coordinates; Slope and approximating slope; Multiplying binomials; Decimals; Graph of the square root function; Inverse functions; Reflection of a curve | 40 - 50 min |
| **Week 4 Challenge** | 40-minute-20 practice problem assessment of Day 1 to Day 4 materials | 60 minutes (up to 4 tries in total) |