# PACE ACADEMY
## MATH 9
## CURRICULUM GUIDE
## S.Y. 2020-2021

| Most Essential Learning Competencies | Math Lessons |
|---|---|
| **FIRST QUARTER** | |
| Illustrate quadratic equations | Lesson 1.1 Quadratic Equations |
| Solve quadratic equations | Lesson 1.2 Extracting Square Roots |
| | Lesson 1.3 Factoring |
| | Lesson 1.4 Completing the Square |
| | Lesson 1.5 The Quadratic Formula |
| Describe the solutions of a quadratic equation using the discriminant<br>Describe the relationship between the coefficients and the solutions of a quadratic equation | Lesson 1.6 The Nature, Sum, and Product of the Solutions of a Quadratic Equation |
| Solve equations transformable to quadratic equations | Lesson 1.7 Equations That Lead to Quadratic Equations |
| Solve problems involving quadratic equations | Lesson 1.8 Applications of Quadratic Equations |
| Illustrate and solve quadratic inequalities | Lesson 1.9 Quadratic Inequalities |
| Illustrate quadratic functions<br>Transform the quadratic function defined by $y = ax^2 + bx + c$ the form $y = a(x - h)^2 + k$ | Lesson 1.10 Quadratic Functions |
| Graph a quadratic function<br>Analyze the effects of changing the values of a, h and k in the equation $y = a(x - h)^2 + k$<br>of a quadratic function on its graph | Lesson 1.11 Graphs of Quadratic Functions |
| Determine the equation of a quadratic function given<br>Solve problems involving quadratic functions | Lesson 1.12 Finding the Equation of a Quadratic Function |
| **SECOND QUARTER** | |
| Write an equation expressing direct variation<br>Find the constant of variation<br>Solve direct variation problems | Lesson 2.1 Direct Variation |
| Write an equation expressing inverse variation<br>Find the constant of variation<br>Solve inverse variation problems | Lesson 2.2 Inverse Variation |
| Write an equation expressing joint variation<br>Find the constant of variation<br>Solve joint variation problems | Lesson 2.3 Joint Variation |
| Write an equation expressing combined variation<br>Find the constant of variation<br>Solve combined variation problems | Lesson 2.4 Combined Variation |
| Evaluate zero, negative, and rational exponents<br>Simplify expressions with rational exponents | Lesson 2.5 Zero, Negative, and Rational Exponents |
| Write expressions with rational exponents as radicals and vice versa<br>Simplify radical expressions using the laws of radicals | Lesson 2.6 Radicals |
| Perform operations on radical expressions | Lesson 2.7 Addition and Subtraction of Radical Expressions |
| | Lesson 2.8 Multiplication of Radical Expressions |
| | Lesson 2.9 Division of Radical Expressions |

| | |
|---|---|
| Solve equations involving radical expressions | Lesson 2.10 Equations with Radicals |
| **THIRD QUARTER** | |
| Recognize and use the properties of parallelograms | Lesson 3.1 Properties of Parallelograms |
| Determine when a quadrilateral is a parallelogram | Lesson 3.2 Tests for Parallelograms |
| Recognize and use the properties of rectangles, rhombi, and squares | Lesson 3.3 Rectangles, Rhombi, and Squares |
| Recognize and use the properties of trapezoids | Lesson 3.4 Properties of Trapezoids |
| Recognize and use the properties of kites | Lesson 3.4 Properties of Kites |
| Describe a proportion<br>Solve proportion and apply the properties of proportion | Lesson 3.5 Concepts of Proportion |
| Recognize similar polygons<br>Find the measure of a side or of an angle of a polygon by using the definition of similar polygons | Lesson 3.6 Similar Polygons |
| Explore the relationship between two triangles that have two pairs of congruent angles<br>State and apply the AA, SAS, and SSS Similarity Theorems for triangles<br>Solve problems that involve triangle similarity | Lesson 3.7 Similar Triangles |
| Use the Pythagorean Theorem to find the length of the side of a right triangle<br>Solve problems that involve right triangles | Lesson 3.8 Introduction to Pythagorean Theorem |
| **FOURTH QUARTER** | |
| Illustrate the six trigonometric ratios: sine, cosine, tangent, secant, cosecant, and cotangent<br>Find the values of the six trigonometric ratios of an acute angle | Lesson 4.1 Trigonometric Ratios |
| Find the values of the six trigonometric ratios of special angles | Lesson 4.2 Trigonometric Ratios of Special Angles |
| Use the trigonometric ratios to find the unknown angles and lengths of the sides of a right triangle | Lesson 4.3 Solutions of Right Triangles |
| Solve problems involving right triangles drawn from everyday situations<br>Define and use angles of elevation and depression in solving problems | Lesson 4.4 Application of Trigonometric Ratio to Right Triangles |
| Use the law of sines to solve any triangle, given two sides and an angle opposite one of them<br>Use the law of sines to solve any triangle, given a side and two angles | Lesson 4.5 The Law of Sines |
| Use the law of cosines to solve triangles given three sides<br>Use the law of cosines to solve triangles given two sides and the included angle | Lesson 4.6 The Law of Cosines |
| Solve problems involving oblique triangles | Lesson 4.7 Application of Sine Law and Cosine Law to Oblique Triangles |

**Reference:**
*Soaring 21st Century Mathematics 9* (2017). Phoenix Publishing House, Inc.


**Time Allotment:** Five (5) synchronous sessions (40 minutes per session); Five (5) asynchronous sessions (40 minutes per session)

**Promotion/Retention:**

- Assessments will be categorized as the following with the corresponding weight:
  - Short Quizzes (20%)
  - Written Outputs (35%)
  - Product and Performance Tasks (45%)
- **Short Quizzes**. These include summative assessments after every lesson, group of related lessons, or chapter.
- **Written Outputs**. These include data recording and analyses, geometric and statistical analyses, graphs, charts, or maps, problem sets, and surveys.
- **Product and Performance Tasks**. TThese include diagrams, mathematical investigatory projects, models or making models of geometric figures, number representations, constructing graphs from survey conducted, multimedia presentation, outdoor math, probability experiments, problem-posing, reasoning and proof through recitation, using manipulatives to show math concepts or solve problems, and using measuring tools and devices.