



## Course Specification

**Course Name:** Mathematics

**Course Code:** MAT51

**Grade:** Grade 10 Advanced

**Aim:** This course is based on MOE/CCSS standards and supports the Common Core Standards for Mathematical Practice. The Resource-Reveal Math Integrated II uses patterns and models that helps students develop a deep conceptual understanding of mathematical relationships and concepts they will need to succeed in school and in life. The key concepts students will be exposed to in this course include quadrilaterals, geometric transformations, similarity, measurement, circles, trigonometry, probability, Quadratic functions and polynomials.

*Content-related biweekly online class assignments on **ALEKS** are essential to support content mastery and develop independent learners' skills.*

Further online practice: <https://my.mheducation.com/login> (Integrated II&III)

### Course Outline:

| Topic                                                                             | Number of Periods |
|-----------------------------------------------------------------------------------|-------------------|
| <b>Term 1</b>                                                                     |                   |
| <b>Topic 1: Polynomials</b>                                                       | <b>17</b>         |
| ● Subtopic 1.1 Adding and Subtracting Polynomials                                 | 3                 |
| ● Subtopic 1.2 Multiplying Monomials and Polynomials                              | 5                 |
| ● Subtopic 1.3 Factoring using the Distributive Property                          | 2                 |
| ● Subtopic 1.4 Factoring and Solving $ax^2 + bx + c = 0$ ( $a = 1$ & $a \neq 1$ ) | 4                 |
| ● Subtopic 1.5 Factoring Special Products                                         | 3                 |
| <b>Topic 2: Quadrilaterals</b>                                                    | <b>17</b>         |
| ● Subtopic 2.1 Angles of Polygons                                                 | 3                 |
| ● Subtopic 2.2 Parallelograms                                                     | 5                 |
| ● Subtopic 2.3 Rectangles                                                         | 3                 |
| ● Subtopic 2.4 Rhombi and Square                                                  | 3                 |
| ● Subtopic 2.5 Trapezoids and Kites                                               | 3                 |
| <b>Topic 3: Similarity</b>                                                        | <b>17</b>         |
| ● Subtopic 3.1 Dilations                                                          | 1                 |
| ● Subtopic 3.2 Similar Polygons                                                   | 3                 |
| ● Subtopic 3.3 Similar Triangles                                                  | 5                 |
| ● Subtopic 3.4 Triangle Proportionality                                           | 3                 |
| ● Subtopic 3.5 Parts of Similar Triangles                                         | 3                 |
| ● Subtopic 3.6 Applying Similarity to Solid Figures                               | 2                 |
| <b>Topic 4: Right Triangles and Trigonometry</b>                                  | <b>19</b>         |
| ● Subtopic 4.1 Geometric Mean                                                     | 2                 |
| ● Subtopic 4.2 Pythagorean Theorem and its Converse                               | 3                 |

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| ● Subtopic 4.3 Coordinates in Space         | 1 |
| ● Subtopic 4.4 Special Right Triangles      | 2 |
| ● Subtopic 4.5 Trigonometry                 | 3 |
| ● Subtopic 4.6 Applying Trigonometry        | 2 |
| ● Subtopic 4.7 The Law of Sines and Cosines | 6 |

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| <b>Topic 1</b>                                                                                                                                                             | <b>Polynomials</b>                                                                                                                                                                        |
| <b>1.1</b>                                                                                                                                                                 | <b>Subtopic: Adding and Subtracting Polynomials</b>                                                                                                                                       |
| <b>Source:</b> Reveal Math Integrated II -Section 11.1: Adding and Subtracting Polynomials                                                                                 |                                                                                                                                                                                           |
| 1.1.1                                                                                                                                                                      | Define and identify monomials <ul style="list-style-type: none"> <li>Identify the numerical coefficient and degree of a monomial</li> </ul>                                               |
| 1.1.2                                                                                                                                                                      | Recognize and classify similar monomials (like terms) <ul style="list-style-type: none"> <li>Two monomials are similar if they have the same variables with the same exponents</li> </ul> |
| 1.1.3                                                                                                                                                                      | Determine whether an expression is a polynomial <ul style="list-style-type: none"> <li>Classify polynomials as monomial, binomial, trinomial, or with more than three terms</li> </ul>    |
| 1.1.4                                                                                                                                                                      | Classify polynomials by degree <ul style="list-style-type: none"> <li>Constant, linear, quadratic, cubic, quartic, quintic, 6<sup>th</sup> degree, and so on</li> </ul>                   |
| 1.1.5                                                                                                                                                                      | Simplify polynomials and write them in simplest form                                                                                                                                      |
| 1.1.6                                                                                                                                                                      | Determine the degree and leading coefficient of a polynomial                                                                                                                              |
| 1.1.7                                                                                                                                                                      | Add and subtract polynomials                                                                                                                                                              |
| 1.1.8                                                                                                                                                                      | Apply polynomials to model and solve geometric and real world applications                                                                                                                |
| <b>1.2</b>                                                                                                                                                                 | <b>Subtopic: Multiplying Monomials and Polynomials</b>                                                                                                                                    |
| <b>Source:</b> Reveal Math Integrated II:<br>Section 11.2: Multiplying Polynomials by Monomials<br>Section 11.3: Multiplying Polynomials<br>Section 11.4: Special Products |                                                                                                                                                                                           |
| 1.2.1                                                                                                                                                                      | Multiply a polynomial by a monomial and express the answer in standard form                                                                                                               |
| 1.2.2                                                                                                                                                                      | Multiply different types of polynomials <ul style="list-style-type: none"> <li>Simplify and express in standard form</li> </ul>                                                           |
| 1.2.3                                                                                                                                                                      | Solve equations with polynomials on both sides                                                                                                                                            |
| 1.2.4                                                                                                                                                                      | Use remarkable identities to expand perfect squares $((a + b)^2$ & $(a - b)^2$ ) and difference of two squares $((a + b)(a - b))$                                                         |
| 1.2.5                                                                                                                                                                      | Solve geometric applications that involve polynomials                                                                                                                                     |
| 1.2.6                                                                                                                                                                      | Demonstrate an ability to reason and solve real-world applications that involve polynomials                                                                                               |
| <b>1.3</b>                                                                                                                                                                 | <b>Subtopic: Factoring using the Distributive Property</b>                                                                                                                                |
| <b>Source:</b> Reveal Math Integrated II -Section 11.5: Using the Distributive Property                                                                                    |                                                                                                                                                                                           |
| 1.3.1                                                                                                                                                                      | Find the greatest common factor of a set of integers                                                                                                                                      |
| 1.3.2                                                                                                                                                                      | Find the greatest common monomial factor of a set of monomials                                                                                                                            |
| 1.3.3                                                                                                                                                                      | Use the distributive property to factorize a polynomial                                                                                                                                   |

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| 1.3.4                                                                                   | Factor by grouping                                                                                                                                                                                                                                                            |
| <b>1.4</b>                                                                              | <b>Subtopic: Factoring and Solving <math>ax^2 + bx + c = 0</math> (<math>a = 1</math> &amp; <math>a \neq 1</math>)</b>                                                                                                                                                        |
| <b>Source:</b> Reveal Math Integrated II – Section 11.6: Factoring Quadratic Trinomials |                                                                                                                                                                                                                                                                               |
| 1.4.1                                                                                   | Factor trinomials of the form $x^2 + bx + c$                                                                                                                                                                                                                                  |
| 1.4.2                                                                                   | Factor trinomials of the form $ax^2 + bx + c$ (case of $a \neq 1$ )                                                                                                                                                                                                           |
| 1.4.3                                                                                   | Use a combination of factoring techniques to factor polynomials                                                                                                                                                                                                               |
| 1.4.4                                                                                   | Identify prime polynomials (polynomials that cannot be factored)                                                                                                                                                                                                              |
| 1.4.5                                                                                   | Use factoring to solve quadratic equations                                                                                                                                                                                                                                    |
| 1.4.6                                                                                   | Demonstrate an ability to reason and solve real-world applications                                                                                                                                                                                                            |
| <b>1.5</b>                                                                              | <b>Subtopic: Factoring Special Products</b>                                                                                                                                                                                                                                   |
| <b>Source:</b> Reveal Math Integrated II – Section 11.7: Factoring Special Products     |                                                                                                                                                                                                                                                                               |
| 1.5.1                                                                                   | Use difference between two squares to factor binomials of the form $a^2 - b^2$                                                                                                                                                                                                |
| 1.5.2                                                                                   | Use perfect square remarkable identity to factor trinomials of the form $a^2 + 2ab + b^2$ and $a^2 - 2ab + b^2$                                                                                                                                                               |
| 1.5.3                                                                                   | Summarize factoring methods by: <ul style="list-style-type: none"> <li>○ Find the GCF</li> <li>○ Checking for a difference of squares or a perfect square trinomial</li> <li>○ Apply the factoring pattern for <math>ax^2 + bx + c</math> or factoring by grouping</li> </ul> |
| 1.5.4                                                                                   | Identify prime polynomials (polynomials that cannot be factored)                                                                                                                                                                                                              |
| 1.5.5                                                                                   | Use special products to simplify quadratic equations into linear equations and solve them                                                                                                                                                                                     |
| 1.5.6                                                                                   | Demonstrate an ability to reason and solve real-world problems                                                                                                                                                                                                                |

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| <b>Topic 2</b>                                                                                               | <b>Quadrilaterals</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>2.1</b>                                                                                                   | <b>Subtopic: Angles of Polygons</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Source:</b> Reveal Math Integrated II –Section 2.1: Angles of Polygons                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2.1.1                                                                                                        | <p>Demonstrate understanding and application of the Polygon Interior Angles Sum Theorem to solve mathematical problems</p> <ul style="list-style-type: none"> <li>○ Explain and use the Interior Angles Sum Theorem for any convex polygon (Sum of interior angles = <math>(n - 2)180^\circ</math>)</li> <li>○ Determine the measure of each interior angle in a regular polygon: <math>\frac{(n-2)180^\circ}{n}</math></li> <li>○ Identify and name polygons based on their number of sides</li> <li>○ Solve for unknown variables, angle measures, or the number of sides in given problems</li> </ul> |
| 2.1.2                                                                                                        | <p>Demonstrate understanding and application of the Polygon Exterior Angles Sum Theorem to solve mathematical problems</p> <ul style="list-style-type: none"> <li>○ State and use the Exterior Angles Sum Theorem (sum of exterior angles = <math>360^\circ</math>)</li> <li>○ Calculate exterior angle measures in regular polygons</li> <li>○ Solve for unknown variables, angle measures, or the number of sides in given problems</li> </ul>                                                                                                                                                         |
| 2.1.3                                                                                                        | Apply knowledge of the Polygon Interior and Exterior Angles Sum Theorems to model and solve geometry and real-world problems                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>2.2</b>                                                                                                   | <b>Subtopic: Parallelograms</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Source:</b> Reveal Math Integrated II –Section 2.2: Parallelograms & Section 2.3: Test for Parallelograms |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2.2.1                                                                                                        | Identify and define a parallelogram as a quadrilateral with both pairs of opposite sides parallel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2.2.2                                                                                                        | <p>Demonstrate understanding of key properties of parallelograms to support problem solving</p> <ul style="list-style-type: none"> <li>○ Opposite sides are congruent</li> <li>○ Opposite angles are congruent</li> <li>○ Consecutive angles are supplementary</li> <li>○ One right angle implies four right angles</li> <li>○ Diagonals bisect each other</li> <li>○ Diagonals divide the parallelogram into two congruent triangles</li> </ul>                                                                                                                                                         |
| 2.2.3                                                                                                        | Apply properties of parallelograms to find missing variables, side lengths, and angle measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 2.2.4                                                                                                        | Recall and use the midpoint and distance formulas between two points                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 2.2.5                                                                                                        | <p>Demonstrate understanding of conditions (theorems) for identifying parallelograms</p> <ul style="list-style-type: none"> <li>○ Both pairs of opposite sides congruent <math>\rightarrow</math> parallelogram</li> <li>○ Both pairs of opposite angles congruent <math>\rightarrow</math> parallelogram</li> <li>○ Diagonals bisect each other <math>\rightarrow</math> parallelogram</li> <li>○ One pair of opposite sides both parallel and congruent <math>\rightarrow</math> parallelogram</li> </ul>                                                                                              |
| 2.2.6                                                                                                        | Use tests and conditions to determine whether a given quadrilateral is a parallelogram                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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| 2.2.7                                                                     | Use tests and conditions to find values of missing variables, side lengths, and angle measures                                                                                                                                                                                                                        |
| 2.2.8                                                                     | Calculate the area of a parallelogram                                                                                                                                                                                                                                                                                 |
| 2.2.9                                                                     | Use coordinate geometry to solve real-world applications involving parallelograms                                                                                                                                                                                                                                     |
| 2.2.10                                                                    | Use coordinate geometry (slope, midpoint, and distance formulas) to determine and justify whether a given quadrilateral is a parallelogram                                                                                                                                                                            |
| <b>2.3</b>                                                                | <b>Subtopic: Rectangles</b>                                                                                                                                                                                                                                                                                           |
| <b>Source:</b> Reveal Math Integrated II –Section 2.4: Rectangles         |                                                                                                                                                                                                                                                                                                                       |
| 2.3.1                                                                     | Identify and define a rectangle as a parallelogram with four right angles                                                                                                                                                                                                                                             |
| 2.3.2                                                                     | Demonstrate understanding of the properties of rectangles to support problem solving <ul style="list-style-type: none"> <li>○ Inherits all properties of parallelograms</li> <li>○ All four angles are right angles (all angles congruent)</li> <li>○ Diagonals are congruent</li> </ul>                              |
| 2.3.3                                                                     | Demonstrate understanding of conditions for identifying rectangles among parallelograms <ul style="list-style-type: none"> <li>○ If a parallelogram is a rectangle, then its diagonals are congruent.</li> <li>○ If the diagonals of a parallelogram are congruent, then the parallelogram is a rectangle.</li> </ul> |
| 2.3.4                                                                     | Apply properties of rectangles to find missing variables, side lengths, and angle measures                                                                                                                                                                                                                            |
| 2.3.5                                                                     | Find missing measures in real-world applications involving rectangles                                                                                                                                                                                                                                                 |
| 2.3.6                                                                     | Use coordinate geometry to determine whether a given parallelogram is a rectangle                                                                                                                                                                                                                                     |
| <b>2.4</b>                                                                | <b>Subtopic: Rhombi and Squares</b>                                                                                                                                                                                                                                                                                   |
| <b>Source:</b> Reveal Math Integrated II –Section 2.5: Rhombi and Squares |                                                                                                                                                                                                                                                                                                                       |
| 2.4.1                                                                     | Identify and define a rhombus as a parallelogram with all four sides congruent                                                                                                                                                                                                                                        |
| 2.4.2                                                                     | Demonstrate understanding of the properties of rhombi to support problem solving <ul style="list-style-type: none"> <li>○ Inherits all properties of parallelograms</li> <li>○ Diagonals are perpendicular</li> <li>○ Each diagonal bisects a pair of opposite angles</li> </ul>                                      |
| 2.4.3                                                                     | Identify and define a square as a parallelogram with all four sides and all four angles congruent <ul style="list-style-type: none"> <li>○ Realize that a square inherits all properties of parallelograms, rectangles, and rhombi</li> </ul>                                                                         |
| 2.4.4                                                                     | Apply properties of rhombi and squares to find missing variables, side lengths, and angle measures                                                                                                                                                                                                                    |
| 2.4.5                                                                     | Demonstrate understanding of conditions (tests) for identifying rhombi and squares <ul style="list-style-type: none"> <li>○ If the diagonals of a parallelogram are perpendicular, then it is a rhombus</li> </ul>                                                                                                    |

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| <ul style="list-style-type: none"> <li>○ If one diagonal of a parallelogram bisects a pair of opposite angles, then it is a rhombus</li> <li>○ If two consecutive sides of a parallelogram are congruent, then it is a rhombus</li> <li>○ If a quadrilateral is both a rectangle and a rhombus, then it is a square</li> </ul>                                                              |
| 2.4.6 Calculate the area of a rhombus                                                                                                                                                                                                                                                                                                                                                       |
| 2.4.7 Find missing measures in real-world applications involving rhombi and squares                                                                                                                                                                                                                                                                                                         |
| 2.4.8 Use coordinate geometry (slope, midpoint, and distance formulas) to determine and justify whether a given quadrilateral is a rhombus, a rectangle, a square, a parallelogram, or none.                                                                                                                                                                                                |
| <b>2.5 Subtopic: Trapezoids and Kites</b>                                                                                                                                                                                                                                                                                                                                                   |
| <b>Source:</b> Reveal Math Integrated II –Section 2.6: Trapezoids and Kites                                                                                                                                                                                                                                                                                                                 |
| 2.5.1 Identify and define a trapezoid as a quadrilateral with exactly one pair of parallel <ul style="list-style-type: none"> <li>○ The parallel sides are called bases.</li> <li>○ The non-parallel sides are called legs.</li> <li>○ A base angle is formed by a base and one of the legs.</li> </ul>                                                                                     |
| 2.5.2 Recognize that if the legs of a trapezoid are congruent, then the trapezoid is isosceles                                                                                                                                                                                                                                                                                              |
| 2.5.3 Demonstrate understanding of key theorems about isosceles trapezoids <ul style="list-style-type: none"> <li>○ If a trapezoid is isosceles, then each pair of base angles is congruent</li> <li>○ If a trapezoid has one pair of congruent base angles, then it is isosceles</li> <li>○ A trapezoid is isosceles if and only if diagonals are congruent</li> </ul>                     |
| 2.5.4 Identify the midsegment of a trapezoid as the segment connecting the midpoints of its legs                                                                                                                                                                                                                                                                                            |
| 2.5.5 Recognize that the midsegment of a trapezoid is parallel to each base and its length is half the sum of the bases                                                                                                                                                                                                                                                                     |
| 2.5.6 Apply properties of trapezoids to find missing variables, side lengths, and angle measures                                                                                                                                                                                                                                                                                            |
| 2.5.7 Calculate the area of a trapezoid                                                                                                                                                                                                                                                                                                                                                     |
| 2.5.8 Use coordinate geometry (slope, midpoint, and distance formulas) to determine and justify whether a given quadrilateral is trapezoid, isosceles trapezoid, or none                                                                                                                                                                                                                    |
| 2.5.9 Identify and define a kite as a convex quadrilateral with exactly two distinct pairs of adjacent congruent sides <ul style="list-style-type: none"> <li>○ Recognize that the opposite sides of a kite are not congruent or parallel</li> <li>○ Exactly one pair of opposite angles is congruent.</li> <li>○ If a quadrilateral is a kite, its diagonals are perpendicular.</li> </ul> |
| 2.5.10 Apply properties of kites to find missing variables, side lengths, and angle measures                                                                                                                                                                                                                                                                                                |
| 2.5.11 Calculate the area of a kite                                                                                                                                                                                                                                                                                                                                                         |

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| <b>Topic 3</b>                                                                                                                                       | <b>Similarity</b>                                                                                                                                                                                                                  |
| <b>3.1</b>                                                                                                                                           | <b>Subtopic: Dilations</b>                                                                                                                                                                                                         |
| <b>Source:</b> Reveal Math Integrated II –Section 3.1: Dilations                                                                                     |                                                                                                                                                                                                                                    |
| 3.1.1                                                                                                                                                | Identify a dilation as a transformation that proportionally enlarges or reduces a figure, with a center and a scale factor                                                                                                         |
| 3.1.2                                                                                                                                                | Determine the scale factor of a dilation and verify whether it is an enlargement or reduction using images, geometric figures, or coordinate plane graphs                                                                          |
| 3.1.3                                                                                                                                                | Find the coordinates of the vertices of an image after a dilation of a given triangle or polygon, using the scale factor <ul style="list-style-type: none"> <li>○ Determine the side lengths</li> <li>○ Graph the image</li> </ul> |
| 3.1.4                                                                                                                                                | Use dilations to solve real-life problems, including (but not limited to) finding the percent of enlargement or reduction, dimensions, and perimeter                                                                               |
| <b>3.2</b>                                                                                                                                           | <b>Subtopic: Similar Polygons</b>                                                                                                                                                                                                  |
| <b>Source:</b> Reveal Math Integrated II –Section 3.2: Similar Polygons                                                                              |                                                                                                                                                                                                                                    |
| 3.2.1                                                                                                                                                | Identify similar polygons <ul style="list-style-type: none"> <li>○ Two polygons are similar if and only if their corresponding angles are congruent and their corresponding side lengths are proportional</li> </ul>               |
| 3.2.2                                                                                                                                                | List pairs of congruent angles and write proportions relating the corresponding sides of any given pair of similar polygons                                                                                                        |
| 3.2.3                                                                                                                                                | Determine whether a given pair of figures is similar, write a similarity statement, and find the scale factor (similarity ratio) if they are similar                                                                               |
| 3.2.4                                                                                                                                                | Use similar figures to find missing angle measures and side lengths                                                                                                                                                                |
| 3.2.5                                                                                                                                                | Use the “Perimeters of Similar Polygons” theorem to find perimeters and missing side lengths                                                                                                                                       |
| <b>3.3</b>                                                                                                                                           | <b>Subtopic: Similar Triangles</b>                                                                                                                                                                                                 |
| <b>Source:</b> Reveal Math Integrated II:<br>Section 3.3: Similar Triangles: AA Similarity<br>Section 3.4: Similar Triangles: SSS and SAS Similarity |                                                                                                                                                                                                                                    |
| 3.3.1                                                                                                                                                | Demonstrate understanding of the AA Postulate, SSS and SAS Similarity Theorems, and identify the conditions sufficient to prove two triangles are similar                                                                          |
| 3.3.2                                                                                                                                                | Use the AA Postulate and the SSS and SAS Theorems to identify similar triangles, write a similarity statement, and find measures of missing angles and side lengths                                                                |
| 3.3.3                                                                                                                                                | Use parts of similar triangles to find missing measures                                                                                                                                                                            |
| 3.3.4                                                                                                                                                | Use similar triangles in real-life contexts to solve for a specific variables                                                                                                                                                      |
| <b>3.4</b>                                                                                                                                           | <b>Subtopic: Triangle Proportionality</b>                                                                                                                                                                                          |
| <b>Source:</b> Reveal Math Integrated II –Section 3.5: Triangle Proportionality                                                                      |                                                                                                                                                                                                                                    |
| 3.4.1                                                                                                                                                | Use the Triangle Proportionality Theorem to find missing measures                                                                                                                                                                  |
| 3.4.2                                                                                                                                                | Use the Converse of the Triangle Proportionality Theorem to prove that lines are parallel                                                                                                                                          |
| 3.4.3                                                                                                                                                | Use the Midsegment Theorem to prove that two lines are parallel and to find missing measures                                                                                                                                       |

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| 3.4.4                                                                             | Use the Proportional Parts of Parallel Lines Corollary to find missing measures                                                                                                                                                                                |
| 3.4.5                                                                             | Use the Congruent Parts of Parallel Lines Corollary to find missing measures                                                                                                                                                                                   |
| 3.4.6                                                                             | Solve problems involving similar triangles in real-life contexts                                                                                                                                                                                               |
| <b>3.5</b>                                                                        | <b>Subtopic: Parts of Similar Triangles</b>                                                                                                                                                                                                                    |
| <b>Source:</b> Reveal Math Integrated II –Section 3.6: Parts of Similar Triangles |                                                                                                                                                                                                                                                                |
| 3.5.1                                                                             | Use the theorem that states: <i>If two triangles are similar, the lengths of the altitudes from corresponding vertices are in the same ratio as the lengths of the corresponding sides</i> , to find missing measures                                          |
| 3.5.2                                                                             | Use the theorem that states: <i>If two triangles are similar, the lengths of the angle bisectors from corresponding vertices are in the same ratio as the lengths of the corresponding sides</i> , to find missing measures                                    |
| 3.5.3                                                                             | Use the corollary that states: <i>If two triangles are similar, the lengths of the medians from corresponding vertices are in the same ratio as the lengths of the corresponding sides</i> , to find missing measures                                          |
| 3.5.4                                                                             | Use the Triangle Angle Bisector Theorem of Similarity, which states: <i>The bisector of an angle of a triangle divides the opposite side into two segments whose lengths are proportional to the lengths of the other two sides</i> , to find missing measures |
| 3.5.5                                                                             | Solve real-life applications                                                                                                                                                                                                                                   |

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| <b>3.6</b>                                                                                   | <b>Subtopic: Applying Similarity to Solid Figures</b>                                                                                                                                                                   |
| <b>Source:</b> Reveal Math Integrated II - Section 6.8: Applying Similarity to Solid Figures |                                                                                                                                                                                                                         |
| 3.6.1                                                                                        | Understand that if two similar solids have a scale factor of <b><math>a:b</math></b> , then the surface areas have a ratio of <b><math>a^2:b^2</math></b> and their volumes have a ratio of <b><math>a^3:b^3</math></b> |
| 3.6.2                                                                                        | Apply knowledge of similar figures to determine perimeters, areas, volumes, and scale factors when the measurements of one figure are provided                                                                          |
| 3.6.3                                                                                        | Use similar figures to solve real-life problems                                                                                                                                                                         |

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| <b>Topic 4</b>                                                                       | <b>Right Triangles and Trigonometry</b>                                                                                                                                                                                                                                                              |
| <b>4.1</b>                                                                           | <b>Subtopic: Geometric Mean</b>                                                                                                                                                                                                                                                                      |
| <b>Source:</b> Reveal Math Integrated II - Section 4.1: Geometric Mean               |                                                                                                                                                                                                                                                                                                      |
| 4.1.1                                                                                | Find the geometric mean of two numbers                                                                                                                                                                                                                                                               |
| 4.1.2                                                                                | Use the theorem that states: <i>The altitude drawn to the hypotenuse of a right triangle separates the hypotenuse into two segments. The length of this altitude is the geometric mean of the lengths of these two segments</i> to find missing lengths                                              |
| 4.1.3                                                                                | Use the theorem that states: <i>The altitude drawn to the hypotenuse of a right triangle separates the hypotenuse into two segments. The length of a leg of this triangle is the geometric mean of the hypotenuse and the segment of the hypotenuse adjacent to that leg</i> to find missing lengths |
| 4.1.4                                                                                | Use geometric means to solve real-life problems                                                                                                                                                                                                                                                      |
| <b>4.2</b>                                                                           | <b>Subtopic: Pythagorean and its Converse</b>                                                                                                                                                                                                                                                        |
| <b>Source:</b> Reveal Math Integrated II - Section 4.2: Pythagorean and its Converse |                                                                                                                                                                                                                                                                                                      |
| 4.2.1                                                                                | Use the Pythagorean Theorem to find missing side lengths in a right triangle                                                                                                                                                                                                                         |
| 4.2.2                                                                                | Use the Triangle Inequality Theorem to determine whether a given set of side lengths can form a triangle <ul style="list-style-type: none"> <li>○ If the vertices are given in the coordinate plane, use the distance formula to calculate the side lengths first</li> </ul>                         |
| 4.2.3                                                                                | Use the converse of the Pythagorean Theorem to classify triangles as acute, right, or obtuse                                                                                                                                                                                                         |
| 4.2.4                                                                                | Use the Pythagorean Theorem to solve real-life problems                                                                                                                                                                                                                                              |
| <b>4.3</b>                                                                           | <b>Subtopic: Coordinates in Space</b>                                                                                                                                                                                                                                                                |
| <b>Source:</b> Reveal Math Integrated II - Section 4.3: Coordinates in Space         |                                                                                                                                                                                                                                                                                                      |
| 4.3.1                                                                                | Graph a rectangular prism with the origin and another point as vertices                                                                                                                                                                                                                              |
| 4.3.2                                                                                | Determine the coordinates of the midpoint of a segment joining two points, and find the distance between them                                                                                                                                                                                        |
| <b>4.4</b>                                                                           | <b>Subtopic: Special Right Triangles</b>                                                                                                                                                                                                                                                             |
| <b>Source:</b> Reveal Math Integrated II -Section 4.4: Special Right Triangles       |                                                                                                                                                                                                                                                                                                      |
| 4.4.1                                                                                | Find missing side lengths and angle measures in 45-45-90 triangles                                                                                                                                                                                                                                   |
| 4.4.2                                                                                | Find missing side lengths and angle measures in 30-60-90 triangles                                                                                                                                                                                                                                   |
| 4.4.3                                                                                | Apply the properties of 45-45-90 and 30-60-90 triangles to solve real-life problems                                                                                                                                                                                                                  |
| <b>4.5</b>                                                                           | <b>Subtopic: Trigonometry</b>                                                                                                                                                                                                                                                                        |
| <b>Source:</b> Reveal Math Integrated II - Section 4.5: Trigonometry                 |                                                                                                                                                                                                                                                                                                      |
| 4.5.1                                                                                | Find the six trigonometric ratios of an acute angle in a right triangle given two side lengths                                                                                                                                                                                                       |
| 4.5.2                                                                                | Find the remaining trigonometric ratios of an acute angle in a right triangle given one of its trigonometric ratios                                                                                                                                                                                  |
| 4.5.3                                                                                | Use trigonometric ratios to find a missing side length in a right triangle                                                                                                                                                                                                                           |
| 4.5.4                                                                                | Apply inverse trigonometric ratios to find the measure of a missing angle                                                                                                                                                                                                                            |
| 4.5.5                                                                                | Use trigonometric ratios and their inverses to solve right triangles in real-life situations                                                                                                                                                                                                         |
| <b>4.6</b>                                                                           | <b>Subtopic: Applying Trigonometry</b>                                                                                                                                                                                                                                                               |
| <b>Source:</b> Reveal Math Integrated II - Section 4.6: Applying Trigonometry        |                                                                                                                                                                                                                                                                                                      |
| 4.6.1                                                                                | Classify angles of elevation and angles of depression                                                                                                                                                                                                                                                |

|       |                                                                                                                                                        |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4.6.2 | Use trigonometric ratios to find missing side lengths and angles in right triangles involving angles of elevation and depression in real-life contexts |
| 4.6.3 | Use trigonometric ratios to solve a variety of real-life applications                                                                                  |
| 4.6.4 | Use trigonometry to find areas of triangles                                                                                                            |

| <b>4.7 Subtopic: The Law of Sines and Cosines</b>                                                                                   |                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>Source:</b> Reveal Math Integrated II:<br>Section 4.7: The Law of Sines and Cosines<br>Section 4.8: The Law of Sines and Cosines |                                                                                         |
| 4.7.1                                                                                                                               | Recall the triangle angle-sum theorem                                                   |
| 4.7.2                                                                                                                               | Use the law of sines to find side lengths and angle measures                            |
| 4.7.3                                                                                                                               | Use the law of sines to determine the number of possible solutions for a given triangle |
| 4.7.4                                                                                                                               | Use the law of cosines to find side lengths and angle measures                          |
| 4.7.5                                                                                                                               | Use the laws of sines and cosines to solve triangles                                    |
| 4.7.6                                                                                                                               | Use the laws of sines and cosines to solve real-life applications                       |