

Math 8 Revised 2018-2019

Topic 1: Real Numbers

Topic Overview: Topic 1 focuses on conceptual understanding of rational and irrational numbers, solving equations using square roots and cube roots, using properties of integer exponents, and solving problems using scientific notation.

Standards:

CC.2.1.8.E.1 Distinguish between rational and irrational numbers using their properties. **CC.2.1.8.E.4** Estimate irrational numbers by comparing them to rational numbers.

M08.A-N.1 Demonstrate an understanding on rational and irrational numbers.

CC.2.2.8.B.1 Apply concepts of radicals and integer exponents to generate equivalent expressions.

M08.B-E.1 Demonstrate an understanding of expressions and equations with radicals and integer exponents.

Essential Question (Core Concepts)

What are real numbers? How are real numbers used to solve problems?

Objectives (Skills/Knowledge)

- Understand Rational and Irrational Numbers
- Identify Perfect Squares and Perfect Cubes
- Understand the Purpose of Scientific Notation
- Recognize Integer Exponent Relationships
- Represent Integer Exponent Properties

Vocabulary

- Cube Root
- Irrational Number
- Negative Exponent Property
- Perfect Cube
- Perfect Square
- Power of Powers Property
- Power of Products Property
- Product of Powers Property
- Quotient of Powers Property
- Scientific Notation
- Square Root
- Zero Exponent Property

Suggested Activities/Strategies/Study Skills

- Problem of the day
- Warm up exercise
- Practice exercises
- Worksheets
- Computers
- Cooperative Learning
- Other relevant activities and online programs as needed

Assessments

Mid-Topic Assessment, Topic Assessment, Vocabulary Assessment, Graded Assignments, Classroom participation

Additional Resources

Additional Practice Worksheets, Enrichment Worksheets

Topic 2: Analyze and Solve Linear Equations

Topic Overview: Topic 2 focuses on expanding students' understanding of proportional relationships learned in Grade 7 to recognize, represent, and interpret a general equation of a line and to further understand slope in linear relationships that are not proportional.

Standards:

CC.2.2.8.B.2 Understand the connections between proportional relationships, lines, and linear equations.

M08.B-E.2 Understand the connections between proportional relationships, lines, and linear equations.

CC.2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations

M08.B-E.3 Analyze and solve linear equations and pairs of simultaneous linear equations.

Essential Question (Core Concepts)

How can we analyze connections between linear equations, and use them to solve problems?

Objectives (Skills/Knowledge)

- Understand Slope
- Solve Equations
- Representing Proportional Relationships

Vocabulary

- Slope
- Y-Intercept
- Slope-Intercept Form

Suggested Activities/Strategies/Study Skills

- Problem of the day
- Warm up exercise
- Practice exercises
- Worksheets
- Computers
- Cooperative Learning
- Other relevant activities and online programs as needed

Assessments

Mid-Topic Assessment, Topic Assessment, Vocabulary Assessment, Graded Assignments, Classroom participation

Additional Resources

Additional Practice Worksheets, Enrichment Worksheets

Topic 3: Use Functions to Model Relationships

Topic Overview: Topic 3 introduces students to functions.

Standards:

CC.2.2.8.C.1 Define, evaluate, and compare functions.

M08.B-F.1 Analyze and interpret functions.

CC.2.2.8.C.2 Use concepts of functions to model relationships between quantities.

M08.B-F.2 Use functions to model relationships between quantities.

Essential Question (Core Concepts)

How can you use functions to model linear relationships?

Objectives (Skills/Knowledge)

- Explore Relations and Functions
- Study the Properties of Functions
- Represent Linear Functions
- Understand Qualitative Graphs

Vocabulary

- Constant Rate of Change
- Function
- Initial Value
- Interval
- Linear Function
- Nonlinear Function
- Qualitative Graph
- Relation

Suggested Activities/Strategies/Study Skills

- Problem of the day
- Warm up exercise
- Practice exercises
- Worksheets
- Computers
- Cooperative Learning
- Other relevant activities and online programs as needed

Assessments

Mid-Topic Assessment, Topic Assessment, Vocabulary Assessment, Graded Assignments, Classroom participation

Additional Resources

Additional Practice Worksheets, Enrichment Worksheets

Topic 4: Investigate Bivariate Data

Topic Overview: Topic 4 focuses on constructing, analyzing, categorizing, and interpreting scatterplots, linear associations, two-way frequency tables, and two-way relative frequency tables.

Standards:

CC.2.4.8.B.1 Analyze and/or interpret bivariate data displayed in multiple representations.

M08.D-S.1 Investigate patterns of association in bivariate data.

Essential Question (Core Concepts)

How can you represent the relationship between paired data and use the representation to make predictions?

Objectives (Skills/Knowledge)

- Explore Paired Data
- Analyze Linear Associations and Models
- Interpret Two-Way Frequency Tables

Vocabulary

- Categorical Data
- Cluster
- Gap
- Measurement Data
- Negative Association
- Outlier
- Positive Association
- Relative Frequency Table
- Scatter Plot
- Trend Line

Suggested Activities/Strategies/Study Skills

- Problem of the day
- Warm up exercise
- Practice exercises
- Worksheets
- Computers
- Cooperative Learning
- Other relevant activities and online programs as needed

Assessments

Mid-Topic Assessment, Topic Assessment, Vocabulary Assessment, Graded Assignments, Classroom participation

Additional Resources

Additional Practice Worksheets, Enrichment Worksheets

Topic 5: Analyze and Solve Systems of Linear Equations

Topic Overview: Topic 5 extends the process of solving equations to solving systems of linear equations.

Standards:

CC.2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations.

M08.B-E.3 Analyze and solve linear equations and pairs of simultaneous linear equations.

Essential Question (Core Concepts)

What does it mean to solve a system of linear equations?

Objectives (Skills/Knowledge)

- Identifying the number of solutions of a system of equations
- Solve systems algebraically

Vocabulary

- Solution of a System of Linear Equations
- System of Linear Equations

Suggested Activities/Strategies/Study Skills

- Problem of the day
- Warm up exercise
- Practice exercises
- Worksheets
- Computers
- Cooperative Learning
- Other relevant activities and online programs as needed

Assessments

Mid-Topic Assessment, Topic Assessment, Vocabulary Assessment, Graded Assignments, Classroom participation

Additional Resources

Additional Practice Worksheets, Enrichment Worksheets

Topic 6: Congruence and Similarity

Topic Overview: Topic 6 focuses on analyzing transformations (translations, reflections, rotations, dilations), understanding congruent and similar figures, understanding angle relationships among angles formed by parallel lines and a transversal, the interior/exterior angles of a triangle, and Angle-Angle (AA) triangle similarity.

Standards:

CC.2.3.8.A.2 Understand and apply congruence, similarity, and geometric transformations using various tools.
M08.C-G.1 Demonstrate an understanding of geometric transformations.

Essential Question (Core Concepts)

How can you show that two figures are either congruent or similar to one another?

Objectives (Skills/Knowledge)

- Understand Properties of Transformations
- Identify Congruent Figures
- Recognize Angle Relationships

Vocabulary

- Alternate Interior Angle
- Angle of Rotation
- Center of Rotation
- Congruent
- Corresponding Angles
- Dilation
- Enlargement
- Exterior Angle of a Triangle
- Image
- Line of Reflection
- Reduction
- Reflection
- Remote Interior Angles
- Rotation
- Same-Side Interior Angles
- Scale Factor
- Similar
- Transformation
- Translation
- Transversal

Suggested Activities/Strategies/Study Skills

- Problem of the day
- Warm up exercise
- Practice exercises
- Worksheets
- Computers
- Cooperative Learning
- Other relevant activities and online programs as needed

Assessments

Mid-Topic Assessment, Topic Assessment, Vocabulary Assessment, Graded Assignments, Classroom participation

Additional Resources

Additional Practice Worksheets, Enrichment Worksheets

Topic 7: Understand and Apply the Pythagorean Theorem

Topic Overview: Topic 7 focuses on extending the knowledge of right triangles from Grade 7 to exploring the Pythagorean Theorem and applying the Pythagorean Theorem to solve real-world or mathematical problems.

Standards:

CC.2.3.8.A.3 Understand and apply the Pythagorean Theorem to solve problems.

M08.C-G.2 Understand and apply the Pythagorean Theorem.

Essential Question (Core Concepts)

How can you use the Pythagorean Theorem to solve problems?

Objectives (Skills/Knowledge)

- Recognize legs and hypotenuse to use the Pythagorean Theorem
- Understand Distance on the Coordinate Plane

Vocabulary

- Converse of the Pythagorean Theorem
- Hypotenuse
- Leg
- Proof
- Pythagorean Theorem

Suggested Activities/Strategies/Study Skills

- Problem of the day
- Warm up exercise
- Practice exercises
- Worksheets
- Computers
- Cooperative Learning
- Other relevant activities and online programs as needed

Assessments

Mid-Topic Assessment, Topic Assessment, Vocabulary Assessment, Graded Assignments, Classroom participation

Additional Resources

Additional Practice Worksheets, Enrichment Worksheets

Topic 8: Solve Problems Involving Surface Area and Volume

Topic Overview: Topic 8 focuses on conceptual understanding of surface area and volume and the procedural skill needed to solve problems involving the surface area and volume of three-dimensional figures.

Standards:

CC.2.3.8.A.1 Apply the concepts of volume of cylinders, cones, and spheres to solve real- world and mathematical problems.

M08.C-G.3 Solve real-world and mathematical problems involving volume.

Essential Question (Core Concepts)

How can you find volume and surface area of three-dimensional figures?

Objectives (Skills/Knowledge)

- Find volume of three-dimensional figures
- Recognize the relationship between volume of three-dimensional figures

Vocabulary

- Composite Figure
- Cone
- Cylinder
- Sphere

Suggested Activities/Strategies/Study Skills

- Problem of the day
- Warm up exercise
- Practice exercises
- Worksheets
- Computers
- Cooperative Learning
- Other relevant activities and online programs as needed

Assessments

Mid-Topic Assessment, Topic Assessment, Vocabulary Assessment, Graded Assignments, Classroom participation

Additional Resources

Additional Practice Worksheets, Enrichment Worksheets