

Grade 8 - Math 8 - Unit 2: Geometry**Massachusetts Learning Standards Taught in this Unit****Expressions and Equations 8.EE****A. Work with radicals and integer exponents.**

1. Know and apply the properties of integer exponents to generate equivalent numerical expressions.
2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that π is irrational.
3. Use numbers expressed in the form of a single digit multiplied by an integer power of 10 to estimate very large or very small quantities, and express how many times as much one is than the other.
4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Geometry 8.G**A. Understand congruence and similarity using physical models, transparencies, or geometry software.**

1. Verify experimentally the properties of rotations, reflections, and translations:
 - a. Lines are transformed to lines, and line segments to line segments of the same length.
 - b. Angles are transformed to angles of the same measure.
 - c. Parallel lines are transformed to parallel lines.
2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations. Given two congruent figures, describe a sequence that exhibits the congruence between them.
3. Describe the effects of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
4. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations. Given two similar two dimensional figures, describe a sequence that exhibits the similarity between them.

B. Understand and apply the Pythagorean Theorem.

6. a. Understand the relationship among the sides of a right triangle.
 - b. Analyze and justify the Pythagorean Theorem and its converse using pictures, diagrams, narratives, or models.
7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
 8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
- C. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.
9. Know the formulas for the volumes of cones, cylinders, and spheres, and use them to solve real-world and mathematical problems.

The Number System 8.NS

A. Know that there are numbers that are not rational, and approximate them by rational numbers.

1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion. For rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g.,

π^2)

Mathematics Practice

1. Make sense of problems and persevere in solving them.

2. Reason abstractly and quantitatively.

3. Construct viable arguments and critique the reasoning of others

4. Model with mathematics.

5. Use appropriate tools strategically

6. Attend to precision.

7. Look for and make use of structure

8. Look for and express regularity in repeated reasoning.