South Carolina Mathematics

Grade 8

Mathematical Process Standards MPS

1 Problem Solving MPS.PS

1a Make sense of problems and persevere in solving them strategically. MPS.PS.1

2 Representation & Communication MPS.RC

2a Explain ideas using precise and contextually appropriate mathematical language, tools, and models. MPS.RC.1

3 Connections MPS.C

3a Demonstrate a deep and flexible conceptual understanding of mathematical ideas, operations, and relationships while making real-world connections. MPS.C.1

4 Analyze & Justify MPS.AJ

4a Use critical thinking skills to reason both abstractly and quantitatively. MPS.AJ.1

5 Structure & Patterns MPS.SP

5a Identify and apply regularity in repeated reasoning to make generalizations. MPS.SP.1

Data, Probability, and Statistical Reasoning 8.DPSR

1 Analyze data sets to identify their statistical elements. 8.DPSR.1

1a Create and analyze scatter plots to represent numerical data sets in mathematical and real-world situations. 8.DPSR.1.1

1b Draw inferences about data sets from two populations using the shape of the distribution, measures of center, and measures of variability. Limit measures to mean, median, mode, range, mean absolute deviation, and interquartile range. 8.DPSR.1.2

1c Describe how adding and deleting data throughout the data set can affect the mean, median, mode, and distribution of the data set. 8.DPSR.1.3

1d For two data sets (numerical or graphical), compare and interpret the centers, spreads, and overlap of data to draw inferences about data in mathematical and real-world situations. Limit displays to double line graphs, back-to-back stem-and-leaf plots, and double box plots. 8.DPSR.1.4

2 Calculate and interpret probability. 8.DPSR.2

2a Determine the sample space for a compound event. 8.DPSR.2.1

2b Calculate and interpret the probability of compound independent and dependent events. 8.DPSR.2.3

Measurement, Geometry, and Spatial Reasoning 8.MGSR

1 Determine the measurements of geometric figures. 8.MGSR.1

- 1a Given the geometric formulas, find the volume of cones, cylinders, and spheres in mathematical and real-world situations. 8.MGSR.1.1
- 1b Find the distance between any two points in the coordinate plane using the Pythagorean Theorem. 8.MGSR.1.2
- 1c Given the Pythagorean Theorem, determine unknown side lengths in right triangles in mathematical and real-world situations. 8.MGSR.1.3
- 1d Determine if a given set of sides forms a right triangle. 8.MGSR.1.4

2 Determine angle and/or side relationships. 8.MGSR.2

- 2a Determine missing angle measurements created when parallel lines are cut by a transversal. 8.MGSR.2.1
- 2b Determine if two-dimensional figures are congruent or similar. 8.MGSR.2.2
- 2c Identify the congruent corresponding angles of similar polygons. 8.MGSR.2.3
- 2d Discover and apply the Exterior Angle Theorem of triangles to find a missing angle. 8.MGSR.2.4
- 2e Apply proportional reasoning to find the missing side lengths of two similar figures. 8.MGSR.2.5

3 Graph on a coordinate plane. 8.MGSR.3

- 1a Identify the transformation as a rotation, reflection, and/or translation. Limit rotations to multiples of 90 degrees centered on the origin. 8.MGSR.3.1
- 1b Identify congruent angles and congruent line segments of a pre-image and its image. 8.MGSR.3.2
- 1c Translate geometric figures vertically and/or horizontally. 8.MGSR.3.3
- 1d Reflect geometric figures with respect to the x-axis and/or y-axis. 8.MGSR.3.4
- 1e Rotate geometric figures 90, 180, and 270 degrees, both clockwise and counterclockwise, about the origin in a coordinate plane.Create a dilation using a given scale factor and describe the effect of a dilation. 8.MGSR.3.5
- 1f Create a dilation using a given scale factor and describe the effect of a dilation. 8.MGSR.3.6
- 1g Describe the effect of a series of transformations, including dilations, translations, rotations, and reflections, on two-dimensional figures using coordinates on the coordinate plane. 8.MGSR.3.7

Numerical Reasoning 8.NR

1 Translate among multiple representations of rational numbers. 8.NR.1

- 1a Convert any form of a rational number to any other form including fractions (mixed numbers), decimals, and percentages. 8.NR.1.1

2 Utilize real numbers in mathematical and real-world situations. 8.NR.2

- 2a Compare real numbers and write statements using is equal to (=), is not equal to (≠), is less than (<), is greater than (>), is greater than or equal to (≥), or is less than or equal to (≤). 8.NR.2.1
- 2b Classify and order the subsets of real numbers in the number system including natural, whole, integer, rational, and irrational numbers. 8.NR.2.2

Patterns, Algebra, and Functional Reasoning 8.PAFR

1 Determine if a table, graph, verbal description, or equation represents a function and describe its characteristics. 8.PAFR.1

- 1a Define an equation in slope-intercept form (y = mx + b) as being a linear function. 8.PAFR.1.1
- 1b Identify and describe the constant rate of change and the y-intercept of a linear function. 8.PAFR.1.2
- 1c Determine if a graph, table, mapping, or verbal description is a function (linear or nonlinear) or not a function. 8.PAFR.1.3
- 1d Describe the key features of given functions, including domain, range, intervals of increasing or decreasing, constant, discrete, continuous, and intercepts. 8.PAFR.1.4
- 1e Use multiple representations including mappings, tables, graphs, verbal description, and equations (only when linear) of two functions to compare the functions and draw conclusions. 8.PAFR.1.5
- 1f Translate among the multiple representations, including mappings, tables, graphs, verbal description, and equations (only when linear) of a function. 8.PAFR.1.6

2 Write, simplify, and evaluate algebraic expressions; write and solve algebraic equations and inequalities. 8.PAFR.2

- 2a Solve multi-step one-variable equations and inequalities with variables on both sides with rational coefficients. 8.PAFR.2.1
- 2b Describe single-variable equations as having one solution, no solution, or an infinite number of solutions. 8.PAFR.2.2
- 2c Identify the rate of change for a linear function as the slope of the line. 8.PAFR.2.3
- 2d Explain why the slope, m, is the same between any two distinct points on a linear graph. 8.PAFR.2.4
- 2e Given a table or a graph, identify the slope and the y-intercept of a line and write a linear equation to express that line. 8.PAFR.2.5

3 Apply mathematical patterns, properties, and algorithms to the set of rational numbers to find sums, differences, products, and quotients and to write equivalent expressions. 8.PAFR.3

- 3a Analyze patterns of perfect squares and perfect cubes to evaluate square roots and cube roots. Limit to square roots less than or equal to 400 and cube roots less than or equal to 1,000. 8.PAFR.3.1
- 3b Approximate non-perfect square roots and cube roots to nearest tenth. Limit to square roots less than or equal to 400 and cube roots less than or equal to 1,000. 8.PAFR.3.2
- 3c Apply laws of exponents to simplify algebraic expressions involving no more than three variables and integer exponents. 8.PAFR.3.3