Arkansas Mathematics Standards

Grade 8

Adopted 2023

Grade 8

Number Concepts & Computations

Rational & Irrational Numbers

A. Understand relationships among numbers and the real number system. 8.NCC.A

1. Describe relationships in the real number system (rational and irrational).
Numbers relationships to include: decimal expansion for rational and irrational numbers, square roots of nonperfect squares, and cube roots of nonperfect cubes 8.NCC.1
2. Compare the size of irrational numbers and locate them on a number line by finding the rational approximations. 8.NCC.2
3. Know and apply the properties of integer exponents to generate equivalent numerical expressions. 8.NCC.3
4. Write very large and very small numbers in scientific notation using positive and negative exponents. 8.NCC.4
5. Compare numbers written in scientific notation to determine how many times larger or smaller one number is than the other, using real-world and mathematical problems. 8.NCC.5
6. Solve real-world and mathematical problems by performing operations with numbers written in standard and scientific notation. 8.NCC.6

Rational Number Operations

B. Work with square and cube roots. 8.NCC.B

7. Solve equations in the form of $x^2 = p$ or $x^3 = p$ where p is a positive rational number. 8.NCC.7
8. Evaluate square roots of perfect squares and cube roots of perfect cubes. 8.NCC.8

Functions

Proportional & Linear Relationships

A. Understand slope using previous learning of proportional relationships. 8.FN.A

1. Graph proportional relationships, interpreting the unit rate as the slope of the graph. 8.FN.1
2. Explain, using similar right triangles, how the slope of a line is the same between two points on a non-vertical line or non-horizontal line. Slope includes: positive, negative, horizontal (zero), and vertical (undefined) 8.FN.2

Functions

B. Understand that a function is a rule that assigns each input exactly one output. 8.FN.B

3. Determine whether a relation is a function or not when given a function map, table, graph, equation, or set of ordered pairs. 8.FN.3
4. Compare the rate of change (slope) and y-intercept (initial value) of two linear functions each represented in different forms.
Functions are represented algebraically, graphically, numerically in tables, or by verbal descriptions. 8.FN.4
5. Distinguish between linear and nonlinear functions by comparing graphs and equations. 8.FN.5
6. Determine the rate of change (slope) and y-intercept (initial value) from tables, graphs, equations, and verbal descriptions of linear relationships. 8.FN.6
7. Interpret and explain the meaning of the rate of change (slope) and y-intercept (initial value) of a linear relationship in a real-world context. 8.FN.7
8. Analyze a graph by describing the functional relationships between two quantities. 8.FN.8
9. Sketch a graph that exhibits qualitative features of a function described verbally. 8.FN.9

Algebra

Equations & Inequalities

A. Solve linear equations and inequalities. 8.ALG.A

1. Analyze and solve one-variable linear equations with rational coefficients containing solutions with one, zero, or infinitely many solutions. 8.ALG.1
2. Analyze and solve one-variable linear inequalities with rational coefficients. 8.ALG.2

Systems of Equations

B. Solve systems of equations. 8.ALG.B

3. Analyze and solve systems of linear equations in the form y = mx + b in real-world or mathematical contexts, graphically and algebraically. 8.ALG.3

Geometry & Measurement

Area, Volume, & Surface Area

A. Solve problems involving area, volume, and surface area. 8.GM.A

1. Apply the formulas for the volume and surface area of cylinders, cones, and spheres to solve real-world and mathematical problems. 8.GM.1

Cross Sections

B. Describe cross sections of three-dimensional figures. 8.GM.B

2. Describe the two-dimensional figure that results from slicing a three-dimensional figure parallel and perpendicular to the base.
Three-dimensional figures include: pyramids, cones, and spheres 8.GM.2

Pythagorean Theorem

C. Explore right triangles and apply the Pythagorean Theorem. 8.GM.C

3. Model or explain an informal proof of the Pythagorean Theorem and its converse. 8.GM.3

4. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles. 8.GM.4

5. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. 8.GM.5

Transformations & Congruence on a Coordinate Plane

D. Use concrete models, diagrams, or geometry to understand congruence and similarity. 8.GM.D

6. Given a figure, draw a congruent figure on a coordinate plane resulting from a rotation, reflection, or translation. 8.GM.6

7. Identify a single transformation used to transform one figure onto another on a coordinate plane.
Rotations include: 90°, 180°, and 270° 8.GM.7

8. Given two congruent figures, describe a sequence of transformations that maps one figure to another. 8.GM.8

9. Perform a given sequence of transformations of a figure on the coordinate plane, including rotations, reflections, translations, and dilations.
Rotations include: 90°, 180°, and 270° 8.GM.9

10. Describe the effects of rotations, reflections, translations, and dilations on two-dimensional figures using coordinates.
Rotations include: 90°, 180°, and 270° 8.GM.10

11. Given two similar two-dimensional figures, describe a sequence of transformations that exhibits similarity, including rotations, reflections, translations, and dilations. 8.GM.11

Statistics & Probability

Bivariate Data

A. Investigate patterns of association to bivariate data. 8.SP.A

1. Construct scatter plots using bivariate data; determine if the data displays a linear or nonlinear pattern and positive, negative, or no association. 8.SP.1
2. Construct straight lines to approximately fit data displaying a linear association when presented in scatter plots. 8.SP.2
3. Construct and interpret a relative frequency table, using data from two categorical variables collected from the same subject. 8.SP.3

Probability

B. Understand theoretical and experimental probability for compound experiments using organized lists, tables, or tree diagrams. 8.SP.B

4. Determine the sample space and use the sample space to determine the theoretical probability of a given set of outcomes for compound experiments, using organized lists, tables, or tree diagrams.
Compound experiments include a combination of two different experiments. 8.SP.4
5. Determine theoretical and experimental probabilities of compound experiments. 8.SP.5
6. Use theoretical probability of an event in a compound experiment to predict the number of times that event will occur for a large number of experiments. 8.SP.6