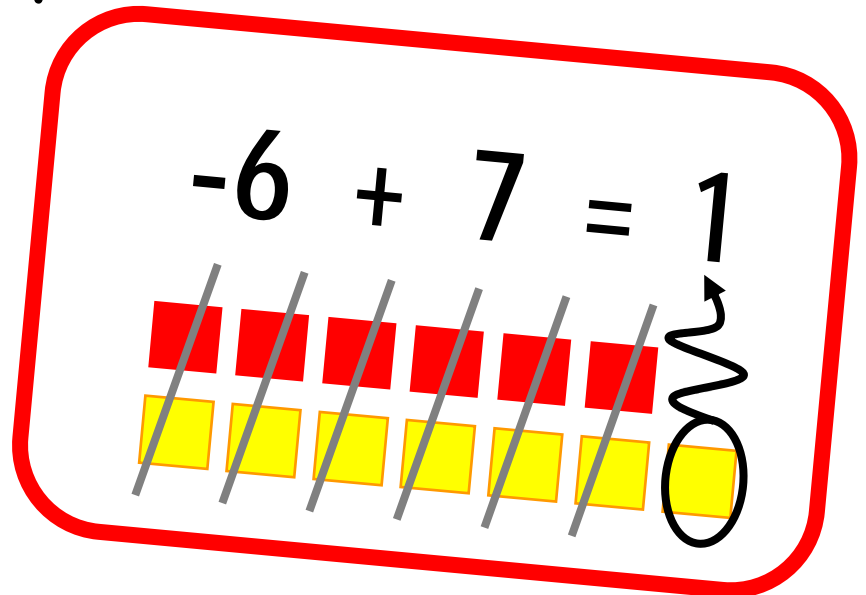


1.0

NUMBER SENSE

Students know the properties of, and compute with, rational numbers expressed in a variety of forms.

$$\frac{3}{4} + \frac{7}{8} =$$



2.0

NUMBER SENSE

Students use exponents, powers, and roots and use exponents in working with fractions.

$$\sqrt{121}$$

$$\frac{4x^2y^3z}{6xy^4z^3}$$

1.0

ALGEBRA AND FUNCTIONS

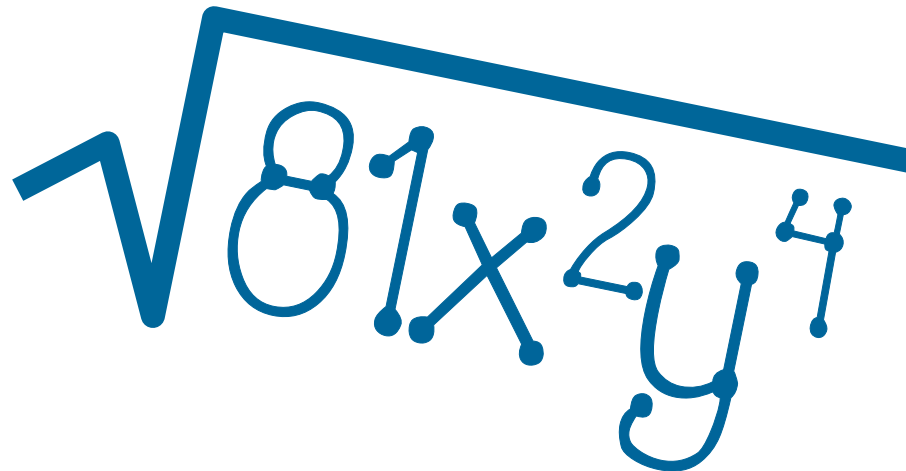
Students express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs.

$$3(2 \cdot 3 + 5)^2$$

2.0

ALGEBRA AND FUNCTIONS

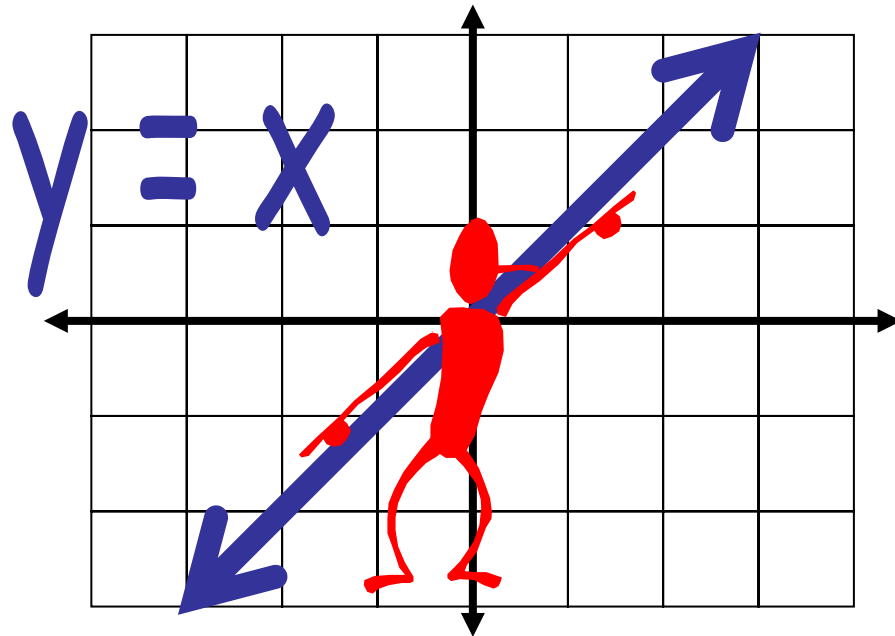
Students interpret and evaluate expressions involving integer powers and simple roots.


$$\sqrt{81x^2y^4}$$

3.0

ALGEBRA AND FUNCTIONS

Students graph and interpret linear and some nonlinear functions.

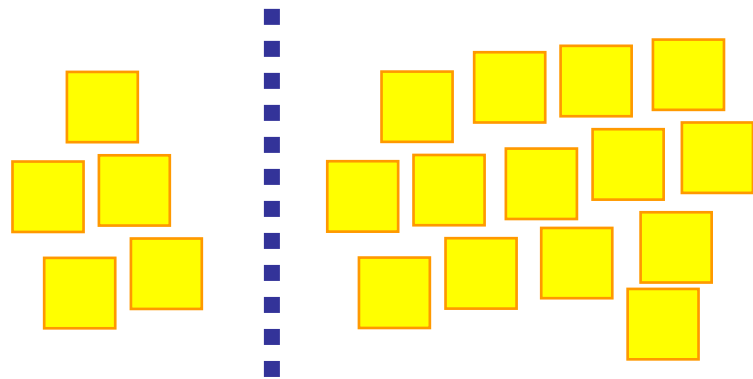
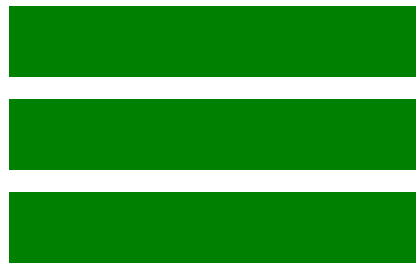


4.0

ALGEBRA AND FUNCTIONS

Students solve simple linear equations and inequalities over the rational numbers.

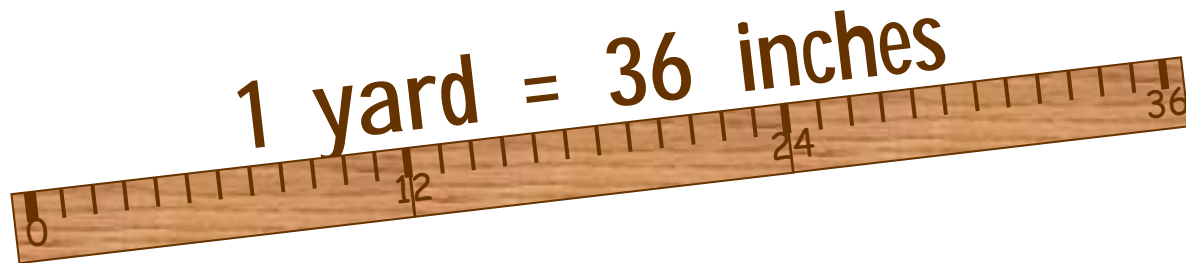
$$3x + 5 = 14$$



1.0

MEASUREMENT AND GEOMETRY

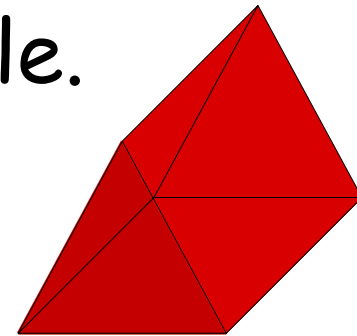
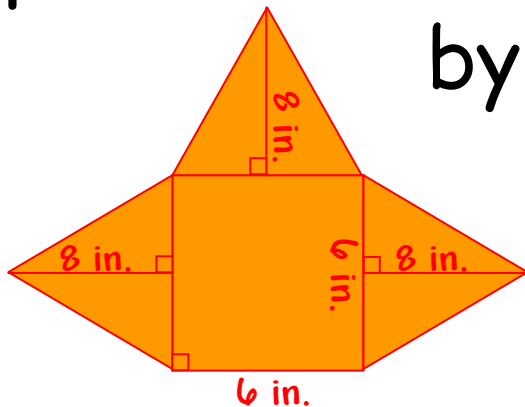
Students choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems.



2.0

MEASUREMENT AND GEOMETRY

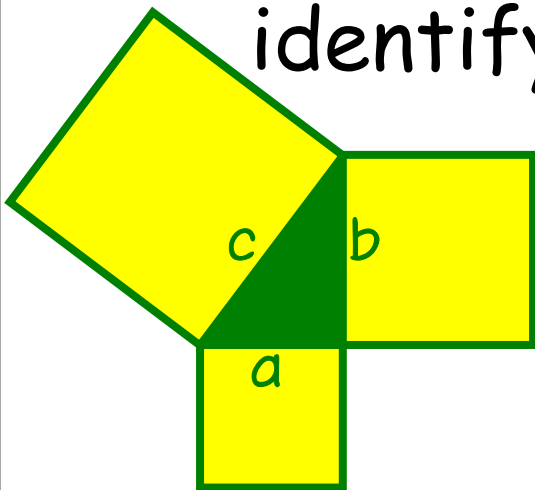
Students compute the perimeter, area, and volume of common geometric objects and use the results to find measures of less common objects. They know how perimeter, area, and volume are affected by changes of scale.



3.0

MEASUREMENT AND GEOMETRY

Students know the Pythagorean theorem and deepen their understanding of plane and solid geometric shapes by constructing figures that meet given conditions and by identifying attributes of figures.



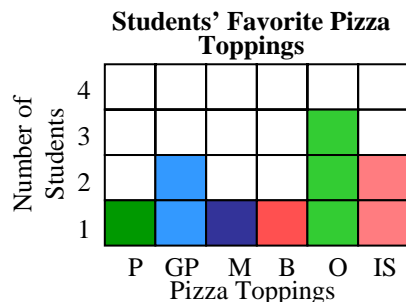
$$a^2 + b^2 = c^2$$

1.0

STATISTICS, DATA ANALYSIS, AND PROBABILITY

Students collect, organize, and represent data sets that have one or more variables and identify relationships among variables within a data set by hand and through the use of an electronic spreadsheet software

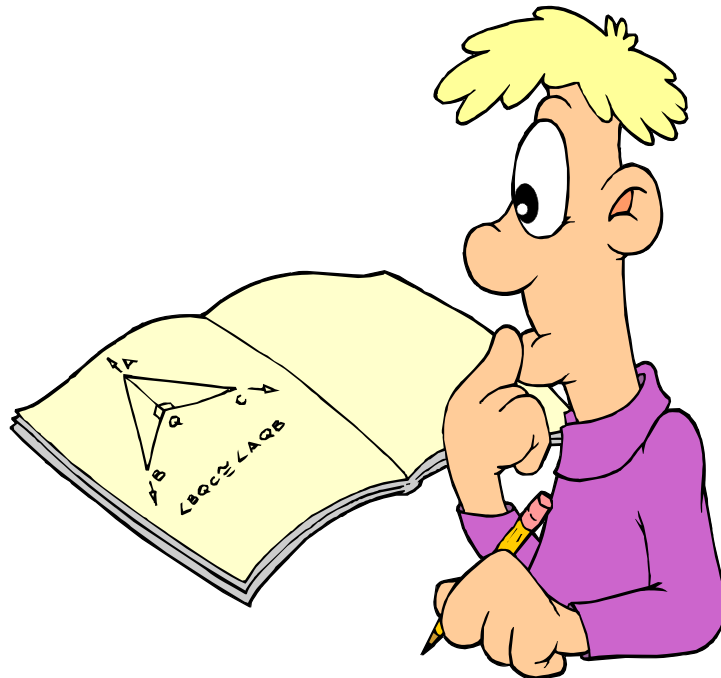
program.



1.0

MATHEMATICAL REASONING

Students make decisions about how to approach problems.



Grade 7

2.0

MATHEMATICAL REASONING

Students use strategies, skills, and concepts in finding solutions.

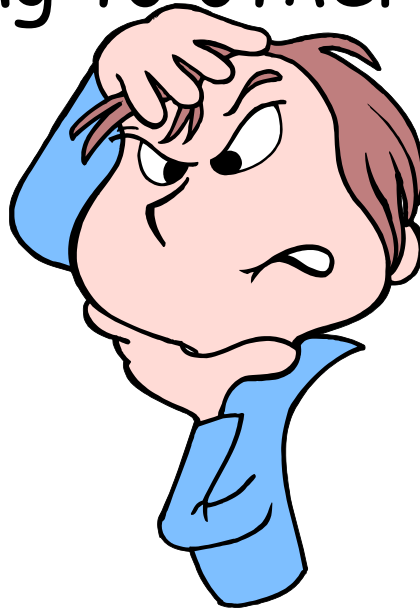


Grade 7

3.0

MATHEMATICAL REASONING

Students determine a solution is complete and move beyond a particular problem by generalizing to other situations.





NUMBER SENSE

Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.

1.2

NUMBER SENSE

Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.

1.3

NUMBER SENSE

Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.

1.4

NUMBER SENSE

Differentiate between rational and irrational numbers.

1.5

NUMBER SENSE

Know that every rational number is either a terminating or repeating decimal and be able to convert terminating decimals into reduced fractions.

1.6

NUMBER SENSE

Calculate the percentage of increases and decreases of a quantity.

1.7

NUMBER SENSE

Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest.

2.1

NUMBER SENSE

Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base.

2.2

NUMBER SENSE

Add and subtract fractions by using factoring to find common denominators.

2.3

NUMBER SENSE

Multiply, divide, and simplify rational numbers by using exponent rules.

2.4

NUMBER SENSE

Use the inverse relationship between raising to a power and extracting the root of a perfect square integer; for an integer that is not square, determine without a calculator the two integers between which its square root lies and explain why.

2.5

NUMBER SENSE

Understand the meaning of the absolute value of a number; interpret the absolute value as the distance of the number from zero on a number line; and determine the absolute value of real numbers.

1.1

ALGEBRA AND FUNCTIONS

Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A).

1.2

ALGEBRA AND FUNCTIONS

Use the correct order of operations to evaluate algebraic expressions such as

$$3(2x^2 + 5)^2.$$

1.3

ALGEBRA AND FUNCTIONS

Simplify numerical expressions by applying properties of rational numbers (e.g., identity, inverse, distributive, associative, commutative) and justify the process used.

1.4

ALGEBRA AND FUNCTIONS

Use algebraic terminology (e.g., variable, equation, term, coefficient, inequality, expression, constant) correctly.

1.5

ALGEBRA AND FUNCTIONS

Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.

2.1

ALGEBRA AND FUNCTIONS

Interpret positive whole-number powers as repeated multiplication and negative whole-number powers as repeated division or multiplication by the multiplicative inverse. Simplify and evaluate expressions that include exponents.

2.2

ALGEBRA AND FUNCTIONS

Multiply and divide monomials; extend the process of taking powers and extracting roots to monomials when the latter results in a monomial with an integer exponent.

3.1

ALGEBRA AND FUNCTIONS

Graph functions of the form $y = nx^2$
and $y = nx^3$ and use in solving problems.

3.2

ALGEBRA AND FUNCTIONS

Plot the values from the volumes of three-dimensional shapes for various values of the edge lengths (e.g., cubes with varying edge lengths or a triangle prism with a fixed height and an equilateral triangle base of varying lengths).

3.3

ALGEBRA AND FUNCTIONS

Graph linear functions, noting that the vertical change (change in y -value) per unit of horizontal change (change in x -value) is always the same and know that the ratio ("rise over run") is called the slope of a graph.

3.4

ALGEBRA AND FUNCTIONS

Plot the values of quantities whose ratios are always the same (e.g., cost to the number of an item, feet to inches, circumference to diameter of a circle). Fit a line to the plot and understand that the slope of the line equals the quantities.

4.1

ALGEBRA AND FUNCTIONS

Solve two-step linear equations and inequalities in one variable over the rational numbers, interpret the solution or solutions in the context from which they arose, and verify the reasonableness of the results.

4.2

ALGEBRA AND FUNCTIONS

Solve multistep problems involving rate, average speed, distance, and time or a direct variation.



MEASUREMENT AND GEOMETRY

Compare weights, capacities, geometric measures, times, and temperatures within and between measurement systems (e.g., miles per hour and feet per second, cubic inches to cubic centimeters).

1.2

MEASUREMENT AND GEOMETRY

Construct and read drawings and models
made to scale.

1.3

MEASUREMENT AND GEOMETRY

Use measures expressed as rates (e.g., speed, density) and measures expressed as products (e.g., person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer.

2.1

MEASUREMENT AND GEOMETRY

Use formulas routinely for finding the perimeter and area of basic two-dimensional figures and the surface area and volume of basic three-dimensional figures, including rectangles, parallelograms, trapezoids, squares, triangles, circles, prisms, and cylinders.

2.2

MEASUREMENT AND GEOMETRY

Estimate and compute the area of more complex or irregular two- and three-dimensional figures by breaking the figures down into more basic geometric objects.

2.3

MEASUREMENT AND GEOMETRY

Compute the length of the perimeter, the surface area of the faces, and the volume of a three-dimensional object built from rectangular solids. Understand that when the lengths of all dimensions are multiplied by a scale factor, the surface area is multiplied by the square of the scale factor and the volume is multiplied by the cube of the scale factor.

Grade 7

2.4

MEASUREMENT AND GEOMETRY

Relate the changes in measurement with a change of scale to the units used (e.g., square inches, cubic feet) and to conversions between units (1 square foot = 144 square inches or $1 \text{ ft}^2 = 144 \text{ in.}^2$, 1 cubic inch is approximately 16.38 cubic centimeters or $1 \text{ in.}^3 = 16.38 \text{ cm}^3$).

3.1

MEASUREMENT AND GEOMETRY

Identify and construct basic elements of geometric figures (e.g., altitudes, midpoints, diagonals, angle bisectors, and perpendicular bisectors; central angles, radii, diameters, and chords of circles) by using a compass and straightedge.

3.2

MEASUREMENT AND GEOMETRY

Understand and use coordinate graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections.

3.3

MEASUREMENT AND GEOMETRY

Know and understand the Pythagorean theorem and its converse and use it to find the length of the missing side of a right triangle and the lengths of other line segments and, in some situations, empirically verify the Pythagorean theorem by direct measurement.

3.4

MEASUREMENT AND GEOMETRY

Demonstrate an understanding of conditions that indicate two geometrical figures are congruent and what congruence means about the relationships between the sides and angles of the two figures.

3.5

MEASUREMENT AND GEOMETRY

Construct two-dimensional patterns for three-dimensional models, such as cylinders, prisms, and cones.

3.6

MEASUREMENT AND GEOMETRY

Identify elements of three-dimensional geometric objects (e.g., diagonals of rectangular solids) and describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect).



STATISTICS, DATA ANALYSIS, AND PROBABILITY

Know various forms of display for data sets, including a stem-and-leaf plot or box-and-whisker plot; use the forms to display a single set of data or to compare two sets of data.

1.2

STATISTICS, DATA ANALYSIS, AND PROBABILITY

Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level).

1.3

STATISTICS, DATA ANALYSIS, AND PROBABILITY

Understand the meaning of, and be able to compute the minimum, the lower quartile, the median, the upper quartile, and the maximum of a data set.



MATHEMATICAL REASONING

Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.

1.2

MATHEMATICAL REASONING

Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.

1.3

MATHEMATICAL REASONING

Determine when and how to break a problem into simpler parts.

2.1

MATHEMATICAL REASONING

Use estimation to verify the reasonableness of calculated results.

2.2

MATHEMATICAL REASONING

Apply strategies and results from simpler problems to more complex problems.

2.3

MATHEMATICAL REASONING

Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.

2.4

MATHEMATICAL REASONING

Make and test conjectures by using both inductive and deductive reasoning.

2.5

MATHEMATICAL REASONING

Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.

2.6

MATHEMATICAL REASONING

Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.

2.7

MATHEMATICAL REASONING

Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.

2.8

MATHEMATICAL REASONING

Make precise calculations and check the validity of the results from the context of the problem.

3.1

MATHEMATICAL REASONING

Evaluate the reasonableness of the solution in the context of the original situation.

3.2

MATHEMATICAL REASONING

Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.

3.3

MATHEMATICAL REASONING

Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.