

Setting the Standard

Raising Academic Achievement

Mathematics

9-12 Standards Guide

for Parents and
Community Members



Student's Name



Setting the Standard, Expecting the Best

Dear Parents and Guardians,

Your child deserves the best — in education and in life. At Cincinnati Public Schools, we want to provide our students with the best opportunities to learn. That includes giving you the tools you need to nurture your child's growth at home.

As adults, we know that we can work harder, and smarter, when we know what's expected of us. This booklet outlines our expectations for what students need to know about math, from 9th through 12th grade. These are not only district but statewide standards, developed by a dedicated group of teachers, parents and school administrators from across Ohio. Together, they provide a guide for the knowledge of mathematics that all successful students need to master.

You won't find a crash course in algebra or trigonometry here, though we have included a glossary to help explain some math terms. Instead, you'll read about the many ways your child will learn to solve problems and analyze information. In addition, we've included tips on how you can support your child's learning.

We hope you'll keep this booklet handy to chart your child's progress through graduation and that you will use it as you talk with teachers about your child's skills and knowledge.

As we work together to help your child, we encourage you to find out more about our district's academic standards, either online or at your child's school. You can also visit the CPS Web site at www.cps-k12.org to see a comprehensive explanation of all the standards (click the Standards button on the home page). The back of this booklet contains additional Internet and other math resources for families.

In the end, these learning goals do more than provide important facts and formulas. They also help us communicate how much confidence we have in your child's ability to learn and grow. Through our standards, we want to make it clear that we expect great things from every CPS student in every one of our schools. And we look forward to working as a partner with you to achieve academic excellence — and a bright future — for your child.

Sincerely,

Alton Frailey
Superintendent
Cincinnati Public Schools

About Mathematics Standards

The Cincinnati Public School District's mathematics content standards are designed to prepare all students for success in school, college and the workplace. They are the same high standards adopted by the Ohio Board of Education in December 2001. The State Department of Education will use these standards in developing new statewide tests to measure student performance.

Before drafting the standards, advisory groups reviewed world-class standards from the United States and other countries. The standards-writing teams included teachers, parents, school administrators and business and college representatives. Before the standards were final, mathematics experts and the public reviewed them and added their feedback.

Described as "rigorous yet realistic," the six standards cover important math concepts and skills — and use of these concepts and skills to solve problems.

Parent Tip

Helping your child succeed in math begins with a positive attitude — yours. Your enthusiasm about your child's learning will rub off and show that math is both important and fun. Engage in an ongoing conversation with your child about math lessons, and you'll set the stage for success not only in the classroom and on tests, but in everyday situations that require a solid math background, such as grocery shopping and balancing a checkbook.

How to use this Guide

Relax.

This guide covers a lot of mathematical ground, but you don't have to. You'll find general, "big picture" overviews of standards. You'll also find grade-specific requirements, known as **indicators**, on pages 4-13. Work with the level and amount of information that fit your family's needs.

Get familiar.

On page 3, you'll find a list of the district's six math standards along with a non-mathematician's explanation of what each one of them means to your child.

Skim and scan.

Each grade-level summary begins with a brief overview that describes how standards fit into your child's overall learning. If you want to know more, you can then read more detailed learning goals. A glossary is included with definitions for many of the mathematics terms used in the grade-level indicators. Words defined in the glossary are written in **bold** type.

Stay involved.

Whether you're helping with homework or preparing for teacher conferences, taking an active role in your child's math education makes a difference. Use the information in this booklet to work closely with teachers and help chart your child's progress. Use pages 20-23 to jot down homework and conference notes.

Explore more.

On page 19, you'll find a list of math education resources — Web sites and books that can help solve math problems and explain complicated concepts. And at every grade level, you'll see a bit of "homework" for you — ways to help build your child's confidence, as well as math skills.

Keep this booklet
handy until your
child completes
12th grade.

9-12 Mathematics Standards

Number, Number Sense and Operations

What it means to your child: Understanding numbers, what they represent and how they are used — from basic counting to pencil-and-paper calculations to age-appropriate use of calculators and computers.

Measurement

What it means to your child: Clearly understanding and successfully using appropriate measurement tools, terms and technology.

Geometry and Spatial Sense

What it means to your child: Identifying, classifying and analyzing one-, two- and three-dimensional objects, as well as understanding their properties and using that understanding to solve problems.

Patterns, Functions and Algebra

What it means to your child: Using tables, graphs and equations to represent, analyze and solve problems based on changeable quantities.

Data Analysis and Probability

What it means to your child: Designing data collection and organizing and interpreting results to answer questions, illustrate relationships and make predictions.

Mathematical Processes

What it means to your child: Using and effectively communicating mathematics to solve practical problems and make decisions.

Ninth-Grade Standards

M A T H E M A T I C S

For ninth-graders, learning about more complicated math principles, algebra and trigonometry leads to new ways to solve and understand the meaning behind a wide range of real-world, number-related problems. Students grow more comfortable creating and solving complex equations with and without changeable variables. As they continue to learn how to classify and analyze data, students enhance their analytical skills and their confidence in using math as a practical tool.

By the end of ninth grade, students should be able to:

■ Number, Number Sense and Operations

- Identify and understand how to use **closure, identity, inverse, commutative** and **associative** properties.
- Compare, understand the use of and create equations with **rational** and **irrational** numbers.
- Explain how quantities change when using multiplication, division and when computing powers and roots, including estimating answers about square roots and cube roots.

■ Measurement

- Convert and solve problems using different rates within the same measurement systems and analyze those measurements. *For example, convert miles per hour to feet per second and then determine a distance traveled.*
- Use ratios of lengths in similar 2- and 3-dimensional figures and objects to determine the ratios of their **areas** and volumes.
- Solve problems with unknown distances and angle measurements using scale drawings and rules regarding **right triangles**.

■ Geometry and Spatial Sense

- Define **sine, cosine** and **tangent** and use these basic functions of trigonometry to solve problems.
- Use formulas to compute slopes and distances in 2-dimensional figures in a single plane.

Parent Tip

Check in with your child's teachers to be sure that math lessons are both challenging and practical. Take this booklet with you and ask how standards have been incorporated into the curriculum.

Ninth-Grade Standards (cont.)

■ Patterns, Functions and Algebra

- Understand the use of ordered pairs, each with a single domain and range element.
- Understand, compare, show in various forms and recognize the characteristics of different types of equations, including those that can be graphed as straight lines (linear) and curves (quadratic and exponential). Use these functions to illustrate patterns and solve problems.
- Add, subtract, multiply and divide numbers that are single terms (3 , 4 , $7x$) and those that join single terms ($4x + 7$, $35x - 4$).
- Simplify expressions of **rational** numbers.
- Use proportions to model and solve problems involving direct and **inverse** relationships.

■ Data Analysis and Probability

- Classify univariate (one variable), bivariate (two variables), **quantitative** and **qualitative** data.
- Illustrate and interpret bivariate data on a **scatterplot**. Recognize and describe relationships in the data.
- Analyze and interpret frequency of data based on a variety of factors, including spread, symmetry, clusters and **outliers**.
- Describe, compare and analyze the accuracy of different types of studies and data sampling methods, including surveys, observations and experiments.
- Understand and use the **Fundamental Counting Principle** to determine the total number of possible outcomes for math situations.
- Calculate probability by describing, creating and analyzing a list of all possible outcomes of an activity.
- Understand differences between independent and dependent events and their probabilities. Use different techniques to estimate probabilities and solve problems.

Tenth-Grade Standards

M A T H E M A T I C S

For tenth-graders, much of math learning focuses on making connections between abstract theories and mathematical realities. They understand the relationships within and between shapes and how to use different functions of geometry. They prove major math theorems, with and without the use of computers and calculators. At the same time, they learn more about how to judge the accuracy and validity of a growing number of ways to solve math-related, real-world problems.

By the end of tenth grade, students should be able to:

■ Number, Number Sense and Operations

- Construct **irrational** numbers in words, symbols and models. *For example, show $\sqrt{2}$ on a number line or in a triangle.*
- Explain the concept of the n th root and determine approximate n th root values for positive numbers. *For example, identify the 4th root of 50 as between 2 and 3.*
- Solve problems using **factorial notation**.

■ Measurement

- Explain how small measurement errors can cause large errors in final calculations.
- Gauge the accuracy of measurements in terms of **relative errors** and absolute errors (includes calculating relative error).
- Measure angles within circles and their associated arcs.

■ Geometry and Spatial Sense

- Define and explain key elements (*angles, segments, etc.*) of geometric figures, including polygons, triangles and circles.
- Explain why terms like point, line and plane must remain undefined.
- Use a variety of proofs and types of reasoning to prove theorems (including **Pythagorean** and others involving triangles, lines and angles) and use physical tools like compasses and/or computer software to test the proofs.

Geometry and Spatial Sense Tenth-Grade Standards (cont.)

- Construct geometric figures (*right triangles, parallelograms, trapezoids, rectangles, rhombi, squares, kites, etc.*) and figures equal to them using compasses and/or computer software.
- Use physical tools, including computer software, to show **rotations** and **reflections** of 2- and 3-dimensional figures.
- Define rules for coordinates and describe what happens after combinations of **translations, reflections** and **rotations**.
- Solve problems involving elements of a single circle, including its **chords, radius** and arcs.

■ Patterns, Functions and Algebra

- Explain and use **function notation**.
- Describe and compare characteristics of different math functions, including **square** and **cube roots** and **absolute value**.
- Use algebra equations and formulas to solve for missing variables as well as illustrate general geometric relationships. *For example, describe the base of a triangle in terms of its area and height.*

Parent Tip

Help ease pre-test math anxiety by making sure your child gets a good night's sleep and a healthy breakfast before heading off to school.

Provide time to unwind after a test.

- Solve equations and inequalities (*greater than, less than, etc.*), including those that have square roots or rational expressions in their solutions.
- Illustrate the relationships between the different elements of circles.
- Explain the relationships between the slopes of parallel and perpendicular lines.
- Solve real-world problems using mathematical functions (square root, exponents, etc.), equations and inequalities.
- Describe how slopes of lines on graphs relate to the **tangent functions** of the angles they create (for points on the positive x-axis).

■ Data Analysis and Probability

- Use words, graphs and algebraic formulas to describe measures of center and range.
- Use appropriate models (**scatterplots, histograms**, tables, charts, etc.) to illustrate, analyze and interpret relationships in bivariate (two variables) data, including data that can be classified by type (*for example, types of dogs*).
- Identify **outliers** in displays of data.
- Describe the impact of intentional and unintentional **bias** on statistical analysis.
- Model geometric probability. Explain, compare and compute the difference between the probability of a given event and the odds of its occurrence.

Eleventh-Grade Standards MATHEMATICS

For eleventh-graders, math learning expands to include complex numbers as they solve more complicated problems. Students find answers to real-world problems by determining the best use of different types of measurements and applying the laws of trigonometry to 3-dimensional objects. As their knowledge of data and statistical analysis continues to grow, students not only design and carry out experiments, but they describe the results in practical terms.

By the end of eleventh grade, students should be able to:

■ Number, Number Sense and Operations

- Create, add and multiply **matrices**, determine which mathematical properties (*commutative, associative, etc.*) apply to them and use them to represent and solve problems. Use paper and pencil and technology as appropriate. (*This also involves Patterns, Functions and Algebra Standards.*)
- Understand the properties of lines and points defined by x and y coordinates on a plane, including complex numbers on the complex plane (numbers that represent points not directly on the x or y axis). Chart these points on a plane and show what happens when they are rotated, mirrored, etc. (*This also involves Geometry and Spatial Sense Standards.*)
- Model, add and multiply points and lines within the x/y axis, including complex numbers, to solve problems. (*This also involves Geometry and Spatial Sense Standards.*)
- Show answers to problems as numbers with fractions and negative values in their exponents.

■ Measurement

- Solve problems by calculating distance, **area**, surface area and volume for 3-dimensional objects to specific numbers of significant digits, and determine how many digits are significant in different measurements.
- Solve problems by measuring degrees of angles and converting values when needed.
- Determine the formula for the surface area of a cone using its height and the width of its base.

■ Geometry and Spatial Sense

- Solve problems using the Law of Sine and the Law of Cosines.
- Identify and draw cross sections of 3-dimensional objects.

■ Patterns, Functions and Algebra

- Describe and compare algebraic functions (**quadratics, polynomials, rational functions, etc.**), including identifying their relationship to the x and y axis on a graph. Use them to solve complex problems. *For example, determine compound interest on a loan or the value of an investment after a specific number of years.*
- Find the maximum and minimum points of math functions on graphs and with calculators and computers.
- Show the **inverse** of functions on graphs and in symbols.
- Solve and interpret results of complex equations with complex roots as well as sets of three linear equations with three variables.
- Describe graphs that represent sections of cones.
- Describe how changing a constant element, such as a number, in an equation changes how it appears on a graph.

Parent Tip

Help your child develop strong study habits – create a quiet place to do homework, an open atmosphere for asking questions and the necessary supplies to stay organized and complete assignments on time.

■ Data Analysis and Probability

- Solve problems by designing an appropriate way to collect data (*experiment, survey, etc.*), then collecting and interpreting the data, including evaluating the influence of chance and using graphs and statistics. Evaluate the validity of the results.

- Explain differences in the values of univariate (one variable) data when the same change is applied to every piece of it.
- Use **scatterplots** to illustrate, interpret and find functions of data with two variables.
- Use computers and calculators to solve problems involving data with two variables, including finding lines that best fit all the data points (Least Squares Regression Line) and standard deviations as well as interpreting statistical results.
- Describe standard curves and their properties.
- Analyze and interpret data with one or two variables and answer questions about data that are assumed to be normal.
- Compute and interpret the expected outcome when using an unpredictable, or random, variable.
- Analyze the amount of risk in practical situations, such as calculating insurance rates and making medical decisions.

Twelfth-Grade Standards

MATHEMATICS

For twelfth-graders, learning math means applying advanced math concepts to everyday problems. After years of study, students understand basic math rules as well as more complex mathematic functions, trigonometry and algebraic theories. They use and analyze graphs, charts and different types of experiments to illustrate and explain problems. As they approach graduation, they use their years of learning to find solutions to practical problems and analyze data to make solid arguments and predictions.

By the end of twelfth grade, students should be able to:

■ Number, Number Sense and Operations

- Explain what mathematical properties apply to both real and imaginary numbers.
- Answer questions about real-world situations (*lottery chances, combinations within groups of people, etc.*) using the **Binomial Theorem**.

■ Measurement

- Solve problems about indirect measurements like acceleration and pressure, including when they involve measuring radii and angles.
- Explain how some measurements can be approximated with increasing accuracy using upper and lower limits and boundaries.

■ Geometry and Spatial Sense

- Transform geometric shapes using matrices.
- Understand trigonometry properties, including angle addition and subtraction.
- Recognize and compare properties of lines, simple curves and sections of cones and represent them on graphs and in equations.

■ Patterns, Functions and Algebra

- Analyze and translate between sequences of numbers and shapes that increase.

Patterns, Functions and Algebra Twelfth-Grade Standards (cont.)

- Describe the characteristics of and compare periodic functions and functions that can't be written in a finite equation (transcendental). Use symbols to represent the **inverse** of functions that can't be written as a finite form, such as **Sine**.
- Solve equations using graphs and **matrices**, with and without computers and calculators.
- Make arguments based on the knowledge that a finite number of steps can prove an infinite number of statements (mathematical induction).

Parent Tip

Encourage your children to set math learning goals for the year and work with them to help them manage their time successfully. Help them develop and stick to realistic study schedules and be sure they allow time for socializing and relaxing, especially after tests.

- Determine the area of rectangles within spaces underneath curves and make estimates of the area of the spaces.
- Translate between points on an different coordinate systems (polar and Cartesian).
- Use the concepts of limits to make arguments and find the rates of change for points on graphs.

■ Data Analysis and Probability

- Identify and use different methods of sampling data in a study, and use the distribution of samples to analyze data.
- Model data with two variables as a mathematical function.
- Find the appropriate statistics to describe data with one variable. Describe the differences in values when the same change is applied to every piece of the data.
- Use the idea of unpredictable, or random, variables to determine the probability of events.
- Determine the probability of uncertain events using experiments and/or theories of probability.

Mathematics

Glossary

Absolute error: The absolute value of the difference between a measured value and its accepted value. Absolute error = | measured value – accepted value |.

Absolute value: The distance of a number from 0 (always positive) on a number line.

Algorithms: Steps and procedures created to solve problems.

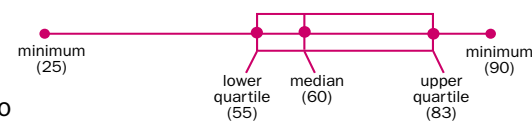
Area: The number of unit squares that can be fit into a 2-dimensional figure.

Associative property: This property states that changes in grouping numbers do not change the end value. For example, “ $a(bc) = (ab)c$.”

Bias: This occurs when part of a statistical population is over- or under-represented.

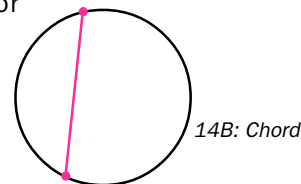
Binomial Theorem: This formula provides a way to solve problems when binomials — or terms that represent a combination of both number and letter variables; $(2 + x)$ — are expanded with exponents.

Box-and-whisker plots: Graphs that show the range of data. (14A)



14A: Box-and-whisker plot

Chord: A straight line from one point in a circle to another. (14B)



14B: Chord

Circle graphs: Graphs that divide data and/or occurrences into pie slices.

Circumference: The distance around a circle.

Closure property: This property states that when you combine any two elements of a closed set, the result will always be in that same set. For example, real numbers multiplied by real numbers will always result in answers that are real numbers.

Commutative property: This property states that when the order of numbers changes, the values do not. For example, “ $4 + 5 = 5 + 4$.”

Compatible numbers: Easy-to-use approximate values of more complicated numbers.

Compensatory numbers: Numbers needed to correct approximations made using compatible numbers.

Composite numbers: Numbers that are not prime. They can be divided by more than 2 factors with no remainders. For example, 12 is composite because its factors are 1, 2, 3, 4, 6 and 12.

Congruent shapes: Forms that have the same shape and size.

Continuous data: Data that can be assigned an infinite number of values between whole numbers.

Cosine: This trigonometric function shows that the cosine of an unknown angle (a) in a right triangle equals the length of the adjacent side divided by the length of the hypotenuse (or longest side). $\cos(A) = \text{length of adjacent side}/\text{length of hypotenuse}$.

Covariants: Varying with another variable quantity in a manner that leaves a specified relationship unchanged. For example, $y = x^2 - 16$.

Cube root: The number which, multiplied by itself twice, equals the original number. For example, the cube root of 8 is 2 because $2 \times 2 \times 2 = 8$.

Cubic units: These units measure volume of 3-dimensional objects.

Diameter: The distance across a circle through the center.

Dilations: These transformations maintain an object’s shape, not its size.

Discrete data: Data that can be counted.

Distributive property: This property states that for any real numbers a, b and c, $a(b+c) = ab + ac$.

Edge: The intersection of two sides of a 3-dimensional object.

Face: The shape bounded by the edges on a 3-dimensional object.

Factorial notation: This notation uses a single number to represent a series of multiplications. For example, $6! = 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 720$.

Frequency tables: These tables record the numbers of occurrences of a given variable.

Front-end estimations: These estimates approximate sums by adding or subtracting with similar numerals in the hundreds and/or tens places. For example, $468 + 365 + 234 \cong 400 + 300 + 200 = 900$.

Function notation: This notation is used to solve equations for specific values (or functions) of the variable x. Example: If $f(x) = x^2 + 2x - 1$, find $f(1)$. Answer: $f(1) = (1)^2 + 2(1) - 1 = 1 + 2 - 1 = 2$.

Fundamental Counting Principle: This principle states that all possible outcomes in a list for a particular activity can be found by multiplying the number of ways each event can occur.

Geometric probability: This probability uses models to illustrate the likelihood of uncertain events.

Glossary

Growing patterns: These occur when the relationship between numbers in a pattern involves a progression.

Histograms: These graphs display data frequency through equal intervals with bars. (16A)

Identity property: This property states that adding 0 and multiplying by 1 do not change the values of numbers.

Integers: Whole numbers and their opposites.

Inverse: These operations do the opposite of each other. For example, addition and subtraction are inverses, as are multiplication and division.

Irrational numbers: Numbers that cannot be divided evenly and have unending decimal values. For example, $\pi = 3.1415926 \dots$

Line graphs: Graphs that plot sets of variables on a plane.

Linear units: Units that measure length.

Matrix: A rectangular grouping of numbers in columns and rows (individual entries are known as scalars) used to represent and perform functions with multiple variables. (Plural: matrices)

Mean: The average of a set of numbers. (16B)

Median: The middle number of a set of data grouped in order. (16B)

Mode: The most frequently appearing number or object in a set of data.

Monomials: Numbers written as single units, with or without variables. For example, 3, $45x$ and $58xyz$.

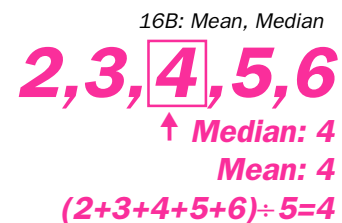
Multiplicative patterns: These occur when the relationship between numbers in a pattern involves multiplication.

Natural numbers: Whole, positive numbers. 1, 2, 3, 4, . . .

Nets: Flat diagrams that can be folded into 3-dimensional solid shapes.

Outliers: Points in a range of data that are widely separated from clusters of main data.

Parallelograms: Four-sided figures in which the opposite sides are parallel to each other.



Percent: Value that represents a part-to-whole relationships. For example, $75\% = 75/100$.

Perimeter: The total distance around the edge of a figure. (17A)

Polynomials: Monomials grouped by addition and/or subtraction.

Prime number: Number that can only be divided by 1 and itself.

Pythagorean Theorem: The formula that computes the lengths of the sides of a right triangle ($a^2 + b^2 = c^2$).

Quadratic formula: The formula that determines the value of an unknown variable (x) in a quadratic equation - $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Quadrilaterals: Four-sided figures or polygons, like squares and trapezoids.

Qualitative: Non-numerical data that can be assigned qualities or categories.

Quantitative: Numerical data.

Radicals: Signs placed before a quantity indicating extraction of a root ($\sqrt{\quad}$).

Radius: The distance from a circle's center to its edge. (Plural: radii)

Range: The highest number minus the lowest number in a set of numbers.

Ratio: This value represents part-to-part and part-to-whole relationships.

Rational numbers: Numbers that can be written as a/b , where a and b are integers and $b \neq 0$.

Rational expression: Fractions whose numerators and denominators are polynomials. For example, $\frac{n^2 - 3n}{2}$

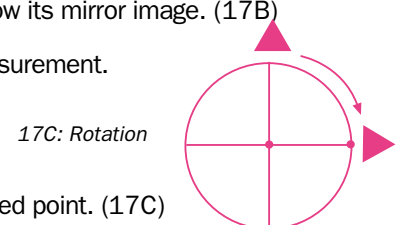
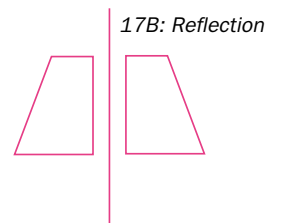
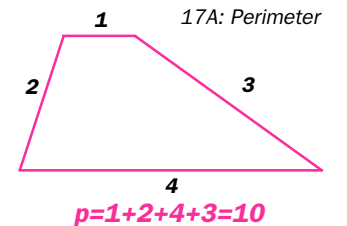
Rectangular arrays: Numbers arranged in rows and columns to illustrate the concept of multiplication.

Reflection: A transformation that flips an object over a line to show its mirror image. (17B)

Relative error: A fraction that represents the uncertainty of a measurement. Relative error = absolute error/accepted value.

Right triangle: Triangle with one 90-degree angle.

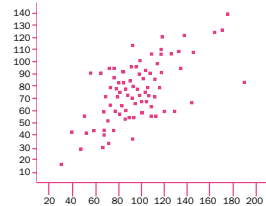
Rotation: A transformation that turns an object around a single fixed point. (17C)



Math Resources for Parents*

Glossary

Scatterplots: Models that represent each item in a set of data as one point that measures two of its attributes. (18A)



18A:
Scatterplots

Scientific notation: Notation method that shows numbers as products of a power of 10 and a decimal number between one and 10. For example, 8,924,000 becomes 8.924×10^6 .

Similar shapes: Forms that have the same shape but different size.

Sine: This trigonometric function shows that the sine of an unknown angle in a right triangle equals the length of the opposite side divided by the length of the hypotenuse (or longest side). $\sin(A) = \text{length of opposite side} / \text{length of hypotenuse}$

Skip counting: Counting by skipping numbers in a pattern. For example, "3, 6, 9, 12, etc."

Square root: The number which, when multiplied by itself, equals the original number.

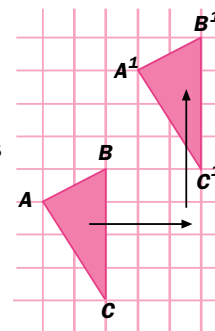
Stem-and-leaf plots: A frequency diagram that displays both the actual data and the data frequency.

Superposition: Occurs when placing one shape on top of another to compare their similarities and differences.

Symmetry: Correspondence in size, form and arrangement of parts on opposite sides of a plane, line or point.

Tangent: The length ratio of the legs of a right triangle. The tangent of an unknown angle equals the length of the leg opposite the angle divided by the length of the leg adjacent to the angle.

18B: Translation



Tangent function: This function measures the arc of an angle created by a line intersecting a graph's point of origin. $\text{Tangent } x = \sin x / \cos x$.

Translations: These are changes in which every point in an object moves the same distance and direction. (18B)

Tree diagram: This type of diagram shows the number of ways an event may occur. For example, one could show the possible combinations after tossing three coins.

Venn diagram: This type of diagram consists of circles that do and/or do not intersect to show relationships between more than one set.

Vertex: The point of intersection of two segments, lines or rays.

Zero of a function: The solution to an equation which intersects the x-axis on a graph ($x = 0$).

<http://www.figurethis.org/>

A site dedicated to fun math activities for the family.

<http://sosmath.com/>

Offers more than 2,500 pages of math help, explained in easy-to-understand language.

<http://askdrmath.com/>

This resource from Drexel University provides math resources by subject and a large archive of answers to specific and general math questions.

<http://school.discovery.com/homeworkhelp/webmath/>

The Discovery School's math helper offers help with homework as well as math lessons that parents and students can work on together.

<http://www.nctm.org/corners/families/index.htm>

The National Council of Teachers of Mathematics Web site offers a family corner with tips for parents.

<http://www.ed.gov/pubs/parents/LearnPtnrs/math>

This U.S. Department of Education link outlines family activities that practice math for the fun of it.

<http://www.mathgoodies.com/>

Interactive math lessons, homework help, worksheets and puzzles with a special section geared toward parents.

Math Coach: A Parent's Guide to Helping Children Succeed in Math, by Wayne A. Wickelgren and Ingrid Wickelgren (Berkley Publishing Group, 2001)

This guide translates math concepts so parents can help their students learn.

How to Help Your Child Excel in Math: An A to Z Survival Guide, by Brita Immergut (Career Press, Incorporated, 2001)

Simple, easy-to-follow explanations for math terms, from A to Z.

*Please be aware that Internet resources are subject to change.

Homework Notes

This is a good place for you to keep track of your child's homework assignments and how they connect to the standards. It's an opportunity to write down specific skills or concepts in which your child may need some extra help. Just as important, it's a place where you can note positive comments when your child does good work.

Date Notes

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Extra pages are available through the school office or by logging on to the CPS Web site, www.cps-k12.org, and clicking the Standards button.

**Setting
the
Standard**

Cincinnati Public Schools

Raising Academic Achievement

Mathematics

9-12 Standards Guide

for Parents and
Community Members



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Child's Name