North Carolina Department of Public Instruction
INSTRUCTIONAL SUPPORT TOOLS
FOR ACHIEVING NEW STANDARDS

Precalculus ● Glossary of Terms
For the new Standard Course of Study that will be effective in all North Carolina schools in the 2020-21 School Year.

This document is designed to help North Carolina educators teach **Precalculus** Standard Course of Study. NCDPI staff are continually updating and improving these tools to better serve teachers and districts.

What is the purpose of this tool?
This tool provides educators with terminologies that represent the concepts and ideas teachers need to know and understand in order to effectively teach the North Carolina Standard Course of Study and use supporting materials. The Glossary of Terms is not meant to be exhaustive, but seeks to address critical terms and definitions essential in building content knowledge and understanding but also in promoting consistency across disciplines, increased student outcomes, and improved parent communication. This is a living document and will undergo revision and additions in terms over time.

How do I send Feedback?
We intend the explanations and examples in this document to be helpful and specific. That said, we believe that as this document is used, educators will find ways in which the tool can be improved and made even more useful. If there are terms which are either omitted or which you feel are misrepresented in this glossary, please send feedback by completing the Feedback on Mathematic Support Documents form.

Where are the standards and unpacking documents for the North Carolina Standard Course of Study for mathematics?
All standards are located at https://www.dpi.nc.gov/teach-nc/curriculum-instruction/standard-course-study/mathematics

Number and Quantity		
Objective	Word	Definition
PC.N.2.1	matrix	a rectangular array of elements organized in rows and columns.
PC.N.3.1	vector	a quantity associated with both magnitude and direction, which can be represented by a directed line segment whose length is the magnitude and an arrow indicating direction. It is also represented as a directed line segment with a starting point (initial point) and an endpoint (terminal point).

Algebra		
Objective	Word	Definition
PC.A.1.1	sign analysis method	a method, using a graph/chart, to determine which sections satisfy inequalities (also known as the sign analysis chart method). If the inequality is less than zero or less than or equal to zero, then you want all of the negative sections found in the sign analysis chart/graph.
PC.A.2.3	inverse trigonometric functions	inverses of trigonometric functions whose domains have been restricted.

Inverse Trigonometric Functions
$y = \sin^{-1} x$ iff $\sin y = x$ with domain: $-1 \leq x \leq 1$ and range: $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$
$y = \cos^{-1} x$ iff $\cos y = x$ with domain: $-1 \leq x \leq 1$ and range: $0 \leq y \leq \pi$
$y = \tan^{-1} x$ iff $\tan y = x$ with domain: $-\infty \leq x \leq \infty$ and range: $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$
$y = \cot^{-1} x$ iff $\cot y = x$ with domain: $-\infty \leq x \leq \infty$ and range: $0 \leq y \leq \pi$
$y = \sec^{-1} x$ iff $\sec y = x$ with domain: $\lvert x \rvert \geq 1$ and range: $0 \leq y \leq \pi$, $y \neq \frac{\pi}{2}$
$y = \csc^{-1} x$ iff $\csc y = x$ with domain: $\lvert x \rvert \geq 1$ and range: $-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$, $y \neq 0$

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<tr><td>PC.A.2.4</td><td>parametric equations</td><td>when f and g are continuous functions of t on an interval I, then the equations x = f(t) and y = g(t) are parametric equations</td></tr>
<tr><td></td><td>parameter</td><td>a variable, often representing time, upon which x and y are both dependent</td></tr>
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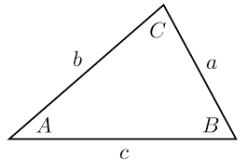
Functions		
Objective	Word	Definition
PC.F.1.1	phase shift	the horizontal displacement of the basic sine or cosine function; the constant, $\frac{C}{B}$
PC.F.1.2	vertical asymptote	see PC.F.4.3
PC.F.2.1	unit circle	a circle whose radius is 1 and whose center is at the origin of a rectangular coordinate system.
	reference angles	the positive acute angle that can represent an angle of any measure. the smallest angle that the terminal side of a given angle makes with the x-axis

PC.F.3.2	Law of Sines	given a triangle with angles and sides opposite labeled as shown, the ratio of sine of angle to length of the opposite side will always be equal, or symbolically, $\frac{\sin A}{a}=\frac{\sin B}{b}=\frac{\sin C}{c}$ 
	Law of Cosines	a generalized form of the Pythagorean Theorem that defines the relationship between angle measures and side lengths in non-right triangles: $a^2 = c^2 + b^2 - 2bc \cos(A)$; $b^2 = a^2 + c^2 - 2ac \cos(B)$; $c^2 = a^2 + b^2 - 2ab \cos(C)$
PC.F.3.3	Pythagorean Identities	See PC.A.2.3
PC.F.4.1	concavity	a function is concave up if the rate of change is increasing. A function is concave down if the rate of change is decreasing. A point where a function changes from concave up to concave down or vice versa is called an inflection point.
	limit	Informal definition: if *f(x)* becomes arbitrarily close to a single number *L* as *x* approaches *c* from either side, then the limit of *f(x)* as *x* approaches *c* is *L*, is written as $\lim_{x \to c} f(x) = L$
PC.F.4.3	horizontal asymptote	a horizontal line *y = b* where the graph approaches the line as the inputs increase or decrease without bound.
	vertical asymptote	a vertical line *x = a* where the graph tends toward positive or negative infinity as the inputs approach *a*.
	Slant (oblique) asymptote	the graph of a rational function (having no common factors and whose denominator is of degree 1 or greater) has a slant asymptote when the degree of the numerator exceeds the degree of the denominator by exactly 1.
PC.F.4.8	conic sections	the set of all points Q(x,y) for which the ratio of the distance from Q to F to the distance from Q to the directrix is some positive constant *e*, call the eccentricity (*e* is not the Euler constant)

	hyperbolas	the set of all points Q(x, y) for which the absolute value of the differences of the distances to two fixed points $F_1(x_1,y_1)$ and $F_2(x_2,y_2)$, called the foci is a constant k: $d(Q,F_1) - d(Q,F_2) = k$.
	ellipse	the set of all points Q(x, y) for which the sum of the distance to two fixed points $F_1(x_1,y_1)$ and $F_2(x_2,y_2)$, called the foci is a constant k: $d(Q,F_1) + d(Q,F_2) = k$.
	parabola	the set of all points Q(x,y) that are an equal distance between the fixed point and the directrix.
PC.F.5.2	composite function	when the output of one function is used as the input of another. We write f(g(x)), and read this as "f of g of x" or "f composed with g at x".
PC.F.5.3	domain of composite function	set of all *x* in the domain of *g* such that *g(x)* is in the domain of *f*.
PC.F.7.2	parametric equations	See PC.A.2.4

Glossary Listed Alphabetically

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 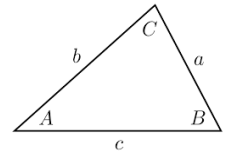 </td></tr>
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