South Carolina State Core Curriculum

Content Standards, adopted 2007

Precalculus	Boardworks Precalculus and Trigonometry presentations
Standard PC-2: The student will demonstrate through the mathematical processes an understanding of the characteristics and behaviors of functions and the effect of operations on functions.	
PC-2.1 Carry out a procedure to graph parent functions (including $y = x^n$, $y = \log_a x$, $y = \ln x$, $y = 1/x$, $y = e^x$, $y = a^x$, $y = \sin x$, $y = \cos x$, $y = \tan x$, $y = \csc x$, $y = \sec x$, and $y = \cot x$).	Trigonometric graphs and exact values The reciprocal trigonometric functions Graphing rational functions Graphs of important non-linear functions Plotting and sketching graphs Graphs of quadratic functions Exponential growth and decay Transforming trigonometric functions Exponentials and logarithms Exponentials with bases other than e The laws of logarithms
PC-2.2 Carry out a procedure to graph transformations (including $-f(x)$, $a \cdot f(x)$, $f(x) + d$, $f(x - c)$, $f(-x)$, $f(b \cdot x)$, $\lvert f(x)\rvert$, and $f(\lvert x\rvert)$) of parent functions and combinations of transformations.	Transforming functions part 1 Transforming functions part 2 Absolute value functions The laws of logarithms Exponentials and logarithms Transforming trigonometric fucntions The reciprocal trigonometric functions
PC-2.3 Analyze a graph to describe the transformation (including $-f(x)$, $a \cdot f(x)$, $f(x) + d$, $f(x - c)$, $f(-x)$, $f(b \cdot x)$, $\lvert f(x)\rvert$, and $f(\lvert x\rvert)$) of parent functions.	Transforming functions part 1 Transforming functions part 2 Absolute value functions The laws of logarithms Exponentials and logarithms Transforming trigonometric fucntions The reciprocal trigonometric functions

PC-2.4 Carry out procedures to algebraically solve equations involving parent functions or transformations of parent functions (including $y = x^n$, $y = \log_a x$, $y = \ln x$, $y = 1/x$, $y = e^x$, $y = a^x$, $y = \sin x$, $y = \cos x$, $y = \tan x$, $y = \csc x$, $y = \sec x$, and $y = \cot x$).	Trigonometric equations The inverse trigonometric functions Questions on trigonometry The sine, cosine and tangent of any angle Trigonometric graphs and exact values The reciprocal trigonometric functions Exponential growth and decay Exponentials and logarithms Exponentials with bases other than e Linear and exponential modeling Solving equations involving logarithms The laws of logarithms
PC-2.5 Analyze graphs, tables, and equations to determine the domain and range of parent functions or transformations of parent functions (including $y = x^n$, $y = \log_a x$, $y = \ln x$, $y = 1/x$, $y = e^x$, $y = a^x$, $y = \sin x$, $y = \cos x$, $y = \tan x$, $y = \csc x$, $y = \sec x$, and $y = \cot x$).	Domain, range and composite functions Inverse functions Trigonometric graphs and exact values The inverse trigonometric functions The reciprocal trigonometric functions Exponential growth and decay Exponentials and logarithms The laws of logarithms
PC-2.6 Analyze a function or the symmetry of its graph to determine whether the function is even, odd, or neither.	Even, odd or periodic functions
PC-2.7 Recognize and use connections among significant points of a function (including roots, maximum points, and minimum points), the graph of a function, and the algebraic representation of a function.	Plotting and sketching graphs Graphing rational functions Graphs of quadratic functions Polynomials of degree 3 or more Graphs of important non-linear functions
PC-2.8 Carry out a procedure to determine whether the inverse of a function exists.	Inverse functions The inverse trigonometric functions
PC-2.9 Carry out a procedure to write a rule for the inverse of a function, if it exists.	Inverse functions The inverse trigonometric functions
Standard PC-3: The student will demonstrate through the mathematical processes an understanding of the behaviors of polynomial and rational functions.	

PC-3.1 Carry out a procedure to graph quadratic and higher-order polynomial functions by analyzing intercepts and end behavior.	Graphs of quadratic functions Plotting and sketching graphs Polynomials of degree 3 or more
PC-3.2 Apply the rational root theorem to determine a set of possible rational roots of a polynomial equation.	The Factor Theorem
PC-3.3 Carry out a procedure to calculate the zeros of polynomial functions when given a set of possible zeros.	Solving quadratic equations The Factor Theorem Plotting and sketching graphs Polynomials of degree 3 or more Dividing polynomials
PC-3.4 Carry out procedures to determine characteristics of rational functions (including domain, range, intercepts, asymptotes, and discontinuities).	Solving rational equations Graphing rational functions Limits Piecewise-defined functions
PC-3.5 Analyze given information to write a polynomial function that models a given problem situation.	Solving quadratic equations Graphs of quadratic functions Parametric equations of curves Using graphing calculators in applications
PC-3.6 Carry out a procedure to solve polynomial equations algebraically.	Solving quadratic equations Operations with polynomials Polynomials of degree 3 or more Dividing polynomials The Factor Theorem
PC-3.7 Carry out a procedure to solve polynomial equations graphically.	Graphs of quadratic functions Plotting and sketching graphs Polynomials of degree 3 or more Using graphing calculators in applications
PC-3.8 Carry out a procedure to solve rational equations algebraically.	Simplifying rational functions Operations with algebraic fractions Improper fractions Partial fractions Solving rational functions
PC-3.9 Carry out a procedure to solve rational equations graphically.	Graphing rational functions
PC-3.10 Carry out a procedure to solve polynomial inequalities algebraically.	Quadratic inequalities
PC-3.11 Carry out a procedure to solve polynomial inequalities graphically.	Quadratic inequalities

Standard PC-4: The student will demonstrate through the mathematical processes an understanding of the behaviors of exponential and logarithmic functions.	
PC-4.1 Carry out a procedure to graph exponential functions by analyzing intercepts and end behavior.	Exponentials and logarithms The laws of logarithms Exponentials with bases other than e
PC-4.2 Carry out a procedure to graph logarithmic functions by analyzing intercepts and end behavior.	Exponentials and logarithms The laws of logarithms Exponentials with bases other than e
PC-4.3 Carry out procedures to determine characteristics of exponential functions (including domain, range, intercepts, and asymptotes).	Exponentials and logarithms The laws of logarithms Exponentials with bases other than e
PC-4.4 Carry out procedures to determine characteristics of logarithmic functions (including domain, range, intercepts, and asymptotes).	Exponential growth and decay Exponentials and logarithms The laws of logarithms Exponentials with bases other than e
PC-4.5 Apply the laws of exponents to solve problems involving rational exponents.	Exponential growth and decay Exponentials and logarithms The laws of logarithms Exponentials with bases other than e Solving quadratic equations Linear and exponential modeling Solving equations involving logarithms
PC-4.6 Analyze given information to write an exponential function that models a given problem situation.	Exponential growth and decay Exponentials and logarithms The laws of logarithms Exponentials with bases other than e Linear and exponential modeling Solving equations involving logarithms

PC-4.7 Apply the laws of logarithms to solve problems.	Exponential growth and decay Exponentials and logarithms The laws of logarithms Exponentials with bases other than e Linear and exponential modeling Solving equations involving logarithms Solving quadratic equations Using graphing calculators in applications
PC-4.8 Carry out a procedure to solve exponential equations algebraically.	Exponential growth and decay Exponentials and logarithms The laws of logarithms Exponentials with bases other than e Linear and exponential modeling Solving equations involving logarithms Solving quadratic equations
PC-4.9 Carry out a procedure to solve exponential equations graphically.	Exponential growth and decay Exponentials and logarithms Exponentials with bases other than e Linear and exponential modeling Using graphing calculators in applications
PC-4.10 Carry out a procedure to solve logarithmic equations algebraically.	Exponentials and logarithms The laws of logarithms Solving equations involving logarithms
PC-4.11 Carry out a procedure to solve logarithmic equations graphically.	Exponentials and logarithms The laws of logarithms
Standard PC-5: The student will demonstrate through the mathematical processes an understanding of the behaviors of trigonometric functions.	
PC-5.1 Understand how angles are measured in either degrees or radians.	Degrees and radians
PC-5.2 Carry out a procedure to convert between degree and radian measures.	Degrees and radians Solving equations using radians
PC-5.3 Carry out a procedure to plot points in the polar coordinate system.	Polar coordinates

PC-5.4 Carry out a procedure to graph trigonometric functions by analyzing intercepts, periodic behavior, and graphs of reciprocal functions.	Even, odd and periodic functions The sine, cosine and tangent of any angle Trigonometric graphs and exact values The reciprocal trigonometric functions Transforming trigonometric functions
PC-5.5 Carry out procedures to determine the characteristics of trigonometric functions (including domain, range, intercepts, and asymptotes).	The sine, cosine and tangent of any angle Trigonometric graphs and exact values The inverse trigonometric functions Transforming trigonometric functions
PC-5.6 Apply a procedure to evaluate trigonometric expressions.	The sine, cosine and tangent of any angle Trigonometric graphs and exact values Trigonometric equations Trigonometric identities 3–D trigonometry Degrees and radians Expressions of the form acos x + bsin x Solving equations using radians The addition formulas The double angle formulas The inverse trigonometric functions The law of cosines The law of sines and the area of a triangle The reciprocal trigonometric functions Trigonometric identities using reciprocal functions Transforming trigonometric functions Questions on trigonometry
PC-5.7 Analyze given information to write a trigonometric function that models a given problem situation involving periodic phenomena.	Transforming trigonometric functions
PC-5.8 Analyze given information to write a trigonometric equation that models a given problem situation involving right triangles.	The sine, cosine and tangent of any angle Trigonometric graphs and exact values The inverse trigonometric functions
PC-5.9 Carry out a procedure to calculate the area of a triangle when given the lengths of two sides and the measure of the included angle.	The law of sines and the area of a triangle

PC-5.10 Carry out a procedure to solve trigonometric equations algebraically.	Trigonometric equations The sine, cosine and tangent of any angle Trigonometric graphs and exact values Expressions of the form acos x + bsin x Solving equations using radians The addition formulas The double angle formulas The inverse trigonometric functions Trigonometric identities The reciprocal trigonometric functions 3–D trigonometry Questions on trigonometry
PC-5.11 Carry out a procedure to solve trigonometric equations graphically.	Trigonometric graphs and exact values The inverse trigonometric functions Using graphing calculators in applications
PC-5.12 Apply the laws of sines and cosines to solve problems.	The law of sines and the area of a triangle The law of cosines
PC-5.13 Apply a procedure to graph the inverse functions of sine, cosine, and tangent.	The inverse trigonometric functions
PC-5.14 Apply trigonometric relationships (including reciprocal identities; Pythagorean identities; even and odd identities; addition and subtraction formulas of sine, cosine, and tangent; and double angle formulas) to verify other trigonometric identities.	The sine, cosine and tangent of any angle Trigonometric graphs and exact values Trigonometric equations Trigonometric identities Expressions of the form acos x + bsin x Questions on trigonometry The addition formulas The double angle formulas The inverse trigonometric functions The law of cosines The law of sines and the area of a triangle The reciprocal trigonometric functions Trigonometric identities using reciprocal functions
PC-5.15 Carry out a procedure to compute the slope of a line when given the angle of inclination of the line.	The sine, cosine and tangent of any angle Slopes and intercepts Rates of change

Standard PC-6: The student will demonstrate through the mathematical processes an understanding of the behavior of conic sections both geometrically and algebraically.	
PC-6.1 Carry out a procedure to graph the circle whose equation is the form $(x - h)^2 + (y - k)^2 = r^2$.	The equation of a circle Conic sections part 1
PC-6.2 Analyze given information about the center and the radius or the center and the diameter to write an equation of a circle.	The equation of a circle Conic sections part 1
PC-6.3 Apply a procedure to calculate the coordinates of points where a line intersects a circle.	Conic sections part 1 Conic sections part 2 The equation of a circle The equation of a straight line
PC-6.4 Carry out a procedure to graph the ellipse whose equation is the form $(x - h)^2/a^2 + (y - k)^2/b^2 = 1$.	Conic sections part 1 Conic sections part 2
PC-6.5 Carry out a procedure to graph the hyperbola whose equation is the form $(x - h)^2/a^2 - (y - k)^2/b^2 = 1$.	Conic sections part 1 Conic sections part 2
PC-6.6 Carry out a procedure to graph the parabola whose equation is the form $y - k = a(x - h)^2$.	Conic sections part 1 Conic sections part 2