

**North Carolina State Core Curriculum**  
**Content Standards, adopted 2003**

Precalculus	Boardworks Precalculus and Trigonometry presentations
<b>Number and Operations</b>	
1.01 Transform relations in two dimensions; describe the results algebraically and geometrically.	Transforming functions part 1 Transforming functions part 1 Plotting and sketching graphs The laws of logarithms Exponentials and logarithms Conic sections part 1 Conic sections part 2 Parametric equations of curves The reciprocal trigonometric functions Transforming trigonometric functions
<b>1.02 Use the quadratic relations (parabola, circle, ellipse, hyperbola) to model and solve problems; justify results.</b>	
a. Solve using tables, graphs, and algebraic properties.	Graphs of important non-linear functions Plotting and sketching graphs Solving quadratic equations Graphs of quadratic functions Conic sections part 1 Conic sections part 2 Parametric equations of curves The equation of a circle
b. Interpret the constants and coefficients in the context of the problem.	Graphs of important non-linear functions Plotting and sketching graphs Solving quadratic equations Graphs of quadratic functions Conic sections part 1 Conic sections part 2 Parametric equations of curves The equation of a circle

1.03 Operate with vectors in two dimensions to model and solve problems.	<p>Vectors in two and three dimensions  The magnitude of a vector  Adding and subtracting vectors  Position vectors and coordinate geometry  The dot product  Vector arithmetic  Using vectors  The vector equation of a line  Intersecting lines  The intersection of a line and a plane  Questions on vectors</p>
<b>Geometry and Measurement</b>	
<b>2.01 Use functions (polynomial, power, rational, exponential, logarithmic, logistic, piecewise-defined, and greatest integer) to model and solve problems; justify results.</b>	

a. Solve using graphs and algebraic properties.	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 Absolute value functions Domain, range and composite functions Graphing rational functions Graphs of important non-linear functions Graphs of quadratic functions Inverse functions Limits Slopes and intercepts Linear graphs The equation of a straight line Piecewise-defined functions Plotting and sketching graphs Polynomials of degree 3 or more Solving quadratic equations Solving rational equations Operations with polynomials Dividing polynomials Even, odd and periodic functions Using graphing calculators in applications
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<p>b. Interpret the constants, coefficients, and bases in the context of the problem.</p>	<p>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  Absolute value functions  Domain, range and composite functions  Graphing rational functions  Graphs of important non-linear functions  Graphs of quadratic functions  Inverse functions  Limits  Linear graphs  Piecewise-defined functions  Plotting and sketching graphs  Polynomials of degree 3 or more  Solving quadratic equations  Solving rational equations  Using graphing calculators in applications</p>
<p><b>2.02 Use trigonometric and inverse trigonometric functions to model and solve problems; justify results.</b></p>	<p></p>

a. Solve using graphs and algebraic properties.	<p>The sine, cosine and tangent of any angle</p> <p>Trigonometric graphs and exact values</p> <p>Trigonometric equations</p> <p>Trigonometric identities</p> <p>The law of cosines</p> <p>The law of sines and the area of a triangle</p> <p>The inverse trigonometric functions</p> <p>The reciprocal trigonometric functions</p> <p>Trigonometric identities using reciprocal functions</p> <p>The addition formulas</p> <p>The double angle formulas</p> <p>Expressions of the form <math>a \cos x + b \sin x</math></p> <p>Transforming trigonometric functions</p> <p>Degrees and radians</p> <p>Solving equations using radians</p> <p>3-D trigonometry</p> <p>Questions on trigonometry</p>
b. Create and identify transformations with respect to period, amplitude, and vertical and horizontal shifts.	<p>Transforming functions part 1</p> <p>Transforming trigonometric functions</p> <p>Trigonometric graphs and exact values</p>
c. Develop and use the law of sines and the law of cosines.	<p>The law of cosines</p> <p>The law of sines and the area of a triangle</p>
<b>2.03 For sets of data, create and use calculator-generated models of linear, polynomial, exponential, trigonometric, power, logistic, and logarithmic functions.</b>	
a. Interpret the constants, coefficients, and bases in the context of the data.	<p>Transforming trigonometric functions</p> <p>Using graphing calculators in applications</p> <p>Graphs of quadratic functions</p> <p>Exponentials and logarithms</p> <p>Exponential growth and decay</p>
b. Check models for goodness-of-fit; use the most appropriate model to draw conclusions or make predictions.	<p>Transforming trigonometric functions</p> <p>Using graphing calculators in applications</p> <p>Linear and exponential modeling</p>

2.04 Use the composition and inverse of functions to model and solve problems.	Exponential growth and decay Exponentials and logarithms Exponentials with bases other than e The laws of logarithms Solving equations involving logarithms Domain, range and composite functions Inverse functions The inverse trigonometric functions
<b>2.05 Use polar equations to model and solve problems.</b>	
a. Solve using graphs and algebraic properties.	Polar coordinates
b. Interpret the constants and coefficients in the context of the problem.	Polar coordinates
2.06 Use parametric equations to model and solve problems.	Parametric functions Parametric equations of curves Questions on vectors
<b>2.07 Use recursively-defined functions to model and solve problems.</b>	
<b>a. Find the sum of a finite sequence.</b>	The sum of a geometric series The sum of an arithmetic series
b. Find the sum of an infinite sequence.	The sum of a geometric series
c. Determine whether a given series converges or diverges.	The sum of a geometric series
d. Translate between recursive and explicit representations.	Sequences Arithmetic sequences Geometric sequences Quadratic sequences part 1 Quadratic sequences part 2 Other types of sequences
2.08 Explore the limit of a function graphically, numerically, and algebraically.	Plotting and sketching graphs Piecewise-defined functions Graphing rational functions Limits