**PreCalculus Honors | North Carolina Final Exam**

**Calculator Commands & Need to Knows!**

**Unit 1: Building Functions**

Function Properties: (1.1-1.3)

* Domain, Range
* Interval Notation
* Minimum, Maximum
* Y intercepts
* X intercepts
* Transformations of functions (1.4)
  + Insides Lie! Outsides Truth!
* Composition & Combinations (1.7)
* Inverse Functions! (Flip and Find) (1.8)

Parent Functions: (1.3)

* Linear
* Square
* Cubic
* Square Root
* Absolute Value
* Step Function
* Logarithmic
* Logistic
* Reciprocal
* Exponential

To Graph a Function:

* Y =

Use 2nd Trace:

* Max
* Min
* Zeros
* Intersect

Adjust Window:

* Zoom Out, In
* X min, X max
* Y min, Y max

**Unit 2: Polynomial and Rational Functions**

To Graph a Function:

* Y =

Use 2nd Trace to find:

* Zeros
* Holes (if any)

Use 2nd graph (table) to find:

* Vertical Asymptotes
* X intercepts
* Y intercepts

Look at graph and see Horizontal Asymptotes!

Polynomial Functions: (2.0)

* Factor polynomials
* Find factors, zeros

Rational Functions: (2.5)

* Find X intercepts
* Find Y Intercepts
* Factor Polynomials
* Find Holes!
* Find Vertical Asymptotes
* Find Horizontal Asymptotes
  + BOB0
  + EATS DC
  + BOTN
  + BOTS

Polynomial Functions: (2.1-2.4)

* End Behavior
* X intercepts
* Y intercepts
* Limits of graphs

Rational Equations (2.6)

* Solve them
* Check for extraneous solutions

**Unit 3: Exponential, Logarithmic, & Logistic Functions**

Logarithmic Functions (3.4)

* Solving for unknown time variables
* Solving for exponents
* Using Inverse Log Properties!
* Exponentiation!
* State the domain and range

To Graph a Logistic Function (3.5):

* Y =
* Zoom out to see the whole functions!

Be able to identify:

* Horizontal Asymptotes
* Maximums
* Initial Values (Y intercepts)

Use 2nd Trace to find:

* Zeros
* Intercepts

Exponential Functions (3.1, 3.2)

Growth equations

* Simple: y = a(1+r)x
* Compound: y = a(1+(r/n))xn
* Continuous Compound: y = pert

**Unit 4: Trigonometric Functions \*Make sure Calculator is in DEGREE MODE\***

Trigonometric Functions (4.6)

* y = a sin(bx – c) + d
* y = a cos(bx – c) + d
* amplitude
* frequency, period
* phase shift
* vertical shift
* Transformations
* Insides lie, outside truth!

Non-Right Triangle Trig (4.2)

* Triangles without 90 degree angles
* Law of Sines
  + 2 pairs of angles and sides
* Law of Cosines
  + SAS cases
* Formulas on Formula Sheet!

Right Triangle Trig (4.1)

* Sin(x)
* Cos(x)
* Tan(x)
* SOH CAH TOA
* Angles of Elevation
* Angles of Depression
* Drawing diagrams from word problems!

**Unit 5: Analytic Trigonometry**

Pythagorean Identities

sin2() + cos2() = 1

1 + cot2() = csc2()

tan2() + 1 = sec2()

Reciprocal & Quotient Identities

sin() = y

cos() = x

tan() = y/x

csc() = 1/sin()

sec() = 1/cos()

tan() = sin() / cos()

cot() = cos() / sin()

* Be able to “Complete the Square” for all types of shapes!
* Circles: center, radius
* Ellipses: center, semi major, major, semi minor, minor, vertices
* Hyperbolas: center, semitransverse, semiconjugate, vertices
* Parabolas: vertex, focus/foci, directrix, focal length

**Unit 6: Conics**

Equations of Shapes:

* Circles: (x-h)2 + (y-k)2 = r2
* Ellipses: (x-h/a)2 + (y-k/b)2 = 1
* Hyperbolas: (x-h/a)2 - (y-k/b)2 = 1
* Parabolas: y = x2; x = y2

**Unit 7: Polar, Parametric, & Vector**

Parametric Functions:

* Functions with 3 variables: x, y, t
  + X = horizontal distance
  + Y = vertical distance
  + T = time
* Eliminating the parameter!
* Graphing in Calculator
  + Mode: Radian, Parametric

Vector Functions:

* Compass and maps!
* Know the difference between North of East and East of North; West of South or South of West; East of South or South of East; West of North or North of West.
* Use Trigonometric concepts to help you solve them!
* You can DO IT!

Polar Functions:

x = rcos()

y = rsin()

r2 = x2 + y2

 = tan-1(y/x)

* Convert between polar & rectangular functions

**Unit 8: Sequences & Series. We just finished this unit. Use your study guide!**