

# MATH FOR EXCELLENCE CURRICULUM

## *Calculus*

### **Prerequisites for Calculus**

- Functions and graphs
- Transformation of functions
- Exponential functions
- Logarithm functions
- Trigonometric functions

### **Functions, graphs and limits**

- Rate of change and Limits
- Limits involving infinity
- Continuity
- Rate of change and tangent lines
- Limits of Functions (incl. one-sided limits)
- Asymptotic and Unbounded Behavior
- Continuity as a Property of Functions

### **Derivatives**

- Concept of the Derivative
- Derivative at a Point
- Derivative as a Function
- Differentiability
- Rules of Differentiation
- Velocity and other rates of change
- Derivatives of Trigonometric functions
- Derivatives of Exponential and Logarithm functions
- Chain Rule
- Implicit Differentiation
- Second Derivatives
- Applications of Derivatives
- Computation of Derivatives

### **Integrals**

- Estimating with Finite Sums
- Definite Integrals
- Interpretations and Properties of Definite Integrals
- Applications of Integrals
- Fundamental Theorem of Calculus
- Definite Integrals and Antiderivatives
- Techniques of Antidifferentiation
- Applications of Antidifferentiation
- Numerical Approximations to Definite Integrals