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Analysis

Guiding Principle

A student at the proficient level in Analysis will be able to demonstrate understanding of high school mathematics by solving problems, reasoning, communicating, representing, making connections and solving word problems based on the following indicators:

| Benchmark/Topics | As a result of studying Analysis, I will be able to: |
|---|---|
| (1) Matrices <ul style="list-style-type: none"> • Basic Operations • Determinants • Inverse (2x2) • Solving • Linear Programming | 3.4.1 Demonstrate an understanding of matrices when I can <ul style="list-style-type: none"> <input type="checkbox"/> Perform basic matrix operations <input type="checkbox"/> Calculate the determinant of a 2x2 and 3x3 matrix <input type="checkbox"/> Determine the inverse of a 2x2 matrix <input type="checkbox"/> Solve a system of equations using matrix operations <input type="checkbox"/> Solve linear programming problems |
| (2) Vectors and Parametrics <ul style="list-style-type: none"> • Operations • Graphing • Applications | 7.5.2 Demonstrate knowledge of vectors and parametrics when I can <ul style="list-style-type: none"> <input type="checkbox"/> Perform vector operations <input type="checkbox"/> Show graphical representations of vectors and parametric equations <input type="checkbox"/> Solve problems using vectors and parametric equations |
| (3) Polars and Complex Numbers <ul style="list-style-type: none"> • Graphing • Operations • Polar Form • Rectangular Form • Polar Coordinates • Rectangular Coordinates | 7.0.3 Demonstrate understanding of polars and complex numbers when I can <ul style="list-style-type: none"> <input type="checkbox"/> Graph on a polar coordinate system <input type="checkbox"/> Perform operations using complex numbers <input type="checkbox"/> Convert between polar and rectangular forms <input type="checkbox"/> Convert between polar and rectangular coordinates |
| (4) Conics <ul style="list-style-type: none"> • Recognition • Definitions • Graphing • Critical Points • Systems of Conics | 4.4.4 Demonstrate my understanding of conic sections when I can <ul style="list-style-type: none"> <input type="checkbox"/> Recognize a conic section from its equation <input type="checkbox"/> Define each conic section in terms of a locus of points <input type="checkbox"/> Graph each conic section and label the distinguishing features of each <input type="checkbox"/> Determine the vertex or vertices, focus or foci, equation of the directrix, equations of asymptotes, major and minor axes <input type="checkbox"/> Find the points of intersection of a system of two or more conics |

| | |
|---|---|
| <p>(5) Series and Sequences</p> <ul style="list-style-type: none"> • Arithmetic • Geometric • Infinite Series • Convergent and Divergent • Sigma Notation • Math Induction | <p>7.5.5 Demonstrate understanding of series and sequences when I can</p> <ul style="list-style-type: none"> <input type="checkbox"/> Recognize the difference between arithmetic and geometric sequences <input type="checkbox"/> Apply the rules of arithmetic and geometric sequences and series in the appropriate situations <input type="checkbox"/> Determine whether a series is convergent or divergent <input type="checkbox"/> Use sigma notation to describe a series <input type="checkbox"/> Perform math induction |
| <p>(6) Limits</p> <ul style="list-style-type: none"> • Calculate Limits • Continuity of Functions • Sandwich Theorem • Limits involving infinity • Formal Definition of a Limit | <p>7.0.6 Demonstrate a basic understanding of limits when I can</p> <ul style="list-style-type: none"> <input type="checkbox"/> Calculate limits <input type="checkbox"/> Determine continuity of a function at a point <input type="checkbox"/> Use the Sandwich Theorem <input type="checkbox"/> Calculate limits involving infinity <input type="checkbox"/> Calculate limits using the formal definition of a limit |
| <p>(7) Derivatives</p> <ul style="list-style-type: none"> • Notation • Definition of derivative • Numerical derivative • Rules of derivatives • Velocity and Acceleration • Derivatives of Trig Functions • Chain Rule • Implicit Differentiation | <p>7.0.7 Demonstrate a basic understanding of derivatives when I can</p> <ul style="list-style-type: none"> <input type="checkbox"/> Use and understand appropriate notation <input type="checkbox"/> Calculate a derivative by use of the definition <input type="checkbox"/> Calculate a derivative by using the numerical derivative <input type="checkbox"/> Apply the rules of derivatives <input type="checkbox"/> Calculate rates of change <input type="checkbox"/> Calculate the derivatives of trig functions <input type="checkbox"/> Apply the chain rule <input type="checkbox"/> Calculate derivatives using implicit differentiation |

*Benchmark Key – State Content Standard . State Benchmark . District Benchmark