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| **Overview of the**  **Precalculus Portfolio**  **2012** |

**Purpose**

1. Students will demonstrate the ability to ***analyze***, ***synthesize***, and ***apply*** cumulative content knowledge.
2. Substance, structure, and evaluation should be aligned with the Class Goals.
3. Substance, structure, and evaluation should be aligned with the twelve major class objectives.

**Structure & Grading**

This portfolio is worth 140 points but may be scaled to accurately represent 20% of your 2nd semester grade.

1. Organization of portfolio is worth (20 points).
2. Organized in a 3 ring binder with author easily identifiable.(3 points)
3. Entries separated by tabs. (3 points)
4. Summary Chart is the first page and,
   1. is well organized, typed or written legibly. (3 points)
   2. each class goal is used at least 3 times. (5 points)
5. Entries follow in numerical order.
   1. Each entry has a portfolio entry reflection sheet that is, (6 points)
      1. typed or written legibly.
      2. filled out completely.
6. Each entry is worth 10 points and will be graded accordingly.
   1. How well the artifact(s) show competency in meeting the proficiencies of the objectives, and goals. (5 points)
   2. Explanations of how artifact(s) meet the objectives and goals. (5 points)

**Precalculus Class Goals:**

1. To promote an awareness and an appreciation of Mathematics.
2. To prepare students to apply Mathematics effectively in today’s world.
3. To promote independent thinking and learning.
4. To prepare students to use current technology as a learning tool.
5. To prepare students to work in group settings.
6. To enable students to make numeric, algebraic and graphical connections within a concept

**Precalculus Major Objectives:**

1. To develop an understanding of function composition.
2. To develop an understanding of transformations of all functions.
3. To develop an understanding of power functions, their graphs and applications.
4. To develop an understanding of polynomial functions, their graphs and applications.
5. To develop an understanding of rational functions, their graphs and applications.
6. To develop an understanding of exponential and logistic functions their gr,aphs and applications.
7. To develop an understanding of logarithmic functions, their graphs and applications.
8. To develop an understanding of vectors and their applications.
9. To develop an understanding of polar coordinates and equations.
10. To develop an understanding of conic sections their graphs, and applications.
11. To develop an understanding of sequences and series.
12. To develop an understanding of limits.

**Precalculus Major Objective Proficiencies**

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| **1.0** | **To develop an understanding of function composition and inverse functions.** |
| 1.1 | Demonstrate understanding of function composition and inherited domain and range. |
| 1.2 | Demonstrates knowledge of function decomposition. |
| 1.3 | Demonstrates knowledge of parametric functions and how they relate to function composition. |
| 1.4 | Demonstrates knowledge of inverse functions and inherited domain and range. |
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| **2.0** | **To develop an understanding of transformations of all functions.** |
| 2.1 | Demonstrate knowledge of graphical transformations by comparing two functions and listing the graphical transformations. |
| 2.2 | Demonstrate knowledge of graphical transformations by rewriting a function from a list of transformations. |
| 2.3 | Demonstrate knowledge of graphical transformations by transforming a graph given transformations. |
| 2.4 | Demonstrate knowledge of all graphical transformations by using each type of transformation. |
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| **3.0** | **To develop an understanding of power functions, their graphs and applications.** |
| 3.1 | Demonstrate knowledge of graphs of different power functions. |
| 3.2 | Demonstrate how to write a power function from a list of data. |
| 3.3 | Demonstrate knowledge of applications of power functions through direct or indirect variation. |
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| **4.0** | **To develop an understanding of polynomial functions, their graphs and applications.** |
| 4.1 | Demonstrate knowledge of the graphs of polynomial functions by graphing a polynomial that shows comprehension of how multiplicity and end behavior affect the graph. |
| 4.2 | Demonstrate how to factor a higher degree polynomial with and without complex zeros. |
| 4.3 | Demonstrate how to factor a higher degree polynomial that has a leading coefficiant that is not one. |
| 4.4 | Demonstrate how to solve polynomial equations and inequalities. |
| 4.5 | Demonstrate knowledge of applications of polynomial functions. |
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| **5.0** | **To develop an understanding of rational functions, their graphs and applications.** |
| 5.1 | Demonstrate knowledge of the graphs of rational functions including all intercepts and asymptotes. |
| 5.2 | Demonstrate knowledge of algebraic manipulation of rational functions. |
| 5.3 | Demonstrate knowledge of utilizing rational functions through applications. |
| 5.4 | Demonstrate knowledge of solving rational functions inequalities. |
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| **6.0** | **To develop an understanding of exponential and logistic functions, their graphs and applications.** |
| **6.1** | Demonstrate how to write exponential models. |
| **6.2** | Demonstrate how to write a logistic models, |
| **6.3** | Demonstrate how to graph an exponential functions |
| **6.4** | Demonstrate how to apply exponential models. |
| **6.5** | Demonstrate how to apply logistic models. |
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| **7.0** | **To develop and understanding of logarithmic functions their graphs and applications.** |
| 7.1 | Demonstrate how to rewrite exponentials into logarithms and logarithms into exponentials using common log, natural log, and logarithms of other bases. |
| 7.2 | Demonstrate knowledge of the properties of logarithms. |
| 7.3 | Demonstrate knowledge of the graphs of logarithms. |
| 7.4 | Demonstrate knowledge of the use of logarithms in applications. |
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| **8.0** | **To develop and understanding of vectors and their applications.** |
| 8.1 | Show the different forms of vectors. |
| 8.2 | Demonstrate a vector application. |
| 8.3 | Show how to find the angle between two vectors. |

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| **9.0** | **To develop and understanding of polar coordinates and equations.** |
| 9.1 | Demonstrate how to graph polar coordinates. |
| 9.2 | Demonstrate how to convert polar coordinates to rectangular coordinates and rectangular to polar. |
| 9.3 | Demonstrate how to convert polar equations to rectangular equations and rectangular to polar. |
| 9.4 | Demonstrate an understanding of the graphs of polar equations. |

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| **10.0** | **To develop and understanding of conic sections their graphs and applications.** |
| 10.1 | Demonstrate knowledge of how to make conic models that fit given conditions. |
| 10.2 | Demonstrate how to graph conic sections from equations. |
| 10.3 | Demonstrate knowledge of applications of conic sections. |
| 10.4 | Demonstrate how to algebraically manipulate conic equations into standard form. |
| 10.5 | Demonstrate knowledge of parabolas, ellipses and hyperbolas. |

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| **11.0** | **To develop an understanding of sequences and series** |
| 11.1 | Demonstrate knowledge of geometric and arithmetic sequences. |
| 11.2 | Demonstrate knowledge of defining sequences explicitly and recursively. |
| 11.3 | Demonstrate knowledge of summations notation. |
| 11.4 | Demonstrate knowledge of summing finite arithmetic and geometric sequences. |
| 11.5 | Demonstrate knowledge of summing infinite geometric sequences. |

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| **12.0** | **To develop an understanding of limits** |
| 12.1 | Demonstrate how to write asymptotes in limit notation. |
| 12.2 | Demonstrate knowledge of removable discontinuity. |

**Precalculus Portfolio**

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| **Class**  **Objectives** | **Title of Entry** | **Class Goals** | | | | | |
| **Awareness & Appreciation** | **Application** | **Independent Thinking** | **Use of Technology** | **Group Work** | **Num/Alg/Graph Connection** |
| **1** |  |  |  |  |  |  |  |
| **2** |  |  |  |  |  |  |  |
| **3** |  |  |  |  |  |  |  |
| **4** |  |  |  |  |  |  |  |
| **5** |  |  |  |  |  |  |  |
| **6** |  |  |  |  |  |  |  |
| **7** |  |  |  |  |  |  |  |
| **8** |  |  |  |  |  |  |  |
| **9** |  |  |  |  |  |  |  |
| **10** |  |  |  |  |  |  |  |
| **11** |  |  |  |  |  |  |  |
| **12** |  |  |  |  |  |  |  |

**Summary Chart**

**Portfolio Entry Reflection Sheet**

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| **Name:** | | | | | |
| **Entry Title:** | | | | | |
| **Class Objective #**  **(circle one)** | | | | | |
| **1 2 3 4 5 6 7 8 9 10 11 12** | | | | | |
| **Class Goals**  **(circle all that apply)** | | | | | |
| **Awareness & Appreciation** | **Application** | **Independent**  **Thinking** | **Appropriate**  **Use of Technology** | **Group Work** | **Numeric Algebraic Graphical**  **Connection** |

**This entry contains . . .** (explain what problem(s) are being used to meet the objective and goals.)

**This entry shows . . .** (explain how the artifact(s) in this entry shows competency of the objective and class goals circled above.