## Berlin Brothersvalley School District Berlin High School Algebra II 4th Nine Weeks

| Big Idea(s) for nine<br>weeks   | Concept(s) of<br>nine weeks  | Competencies of nine weeks  | Essential Questions   |  |
|---|--|---|---|--|
| Numerical quantities,<br>calculations, and<br>measurements can be<br>estimated or analyzed by<br>using appropriate<br>strategies and tools. | <ul> <li>Students will know</li> <li>Quadratic Equations</li> <li>Complex and imaginary numbers</li> <li>Properties of Powers</li> <li>Interest Formula</li> </ul> | <ul> <li>Students will be able to</li> <li>Solve quadratic equations</li> <li>Perform calculations on complex numbers</li> <li>Simplify and rewrite imaginary numbers</li> <li>Apply power properties to simplify expressions</li> <li>Calculate compound interest</li> </ul> | How can expressions,<br>equations and<br>inequalities be used to<br>quantify, solve, model<br>and or analyze<br>mathematical<br>situations? |  |

|   |                   |  |  | 2 |
|---|-------------------|--|--|---|
| <u>Topics</u>   | Approx # of weeks | PA Standards   | Eligible Content   |   |
| Quadratic formula<br>Imaginary numbers<br>Complex Numbers | 2 weeks           | CC.2.2.HS.D.3<br>Extend the knowledge<br>of arithmetic operations<br>and apply to<br>polynomials.  | A1.1.1.5.1<br>A1.1.1.5.2<br>A1.1.1.5.3<br>A2.1.2.2.1<br>A2.1.2.2.2 |   |
|   |                   | CC.2.2.HS.D.4<br>Understand the<br>relationship between<br>zeros and factors of<br>polynomials to make<br>generalizations about<br>functions and their<br>graphs |  |   |
|   |                   | CC.2.2.HS.D.5<br>Use polynomial<br>identities to solve<br>problems.  |  |   |
|   |                   | CC.2.1.HS.F.6<br>Extend the knowledge<br>of arithmetic operations<br>and apply to complex<br>numbers.  |  |   |
|   |                   | CC.2.1.HS.F.7<br>Apply concepts of<br>complex numbers in<br>polynomial identities<br>and quadratic equations<br>to solve problems.                               |  |   |

| <u>Topics</u>              | Approx # of weeks | PA Standards            | Eligible Content |  |
|----------------------------|-------------------|-------------------------|------------------|--|
| Power Functions            | 5 weeks           | CC.2.1.HS.F.1           |                  |  |
| Properties of Powers       |                   | Apply and extend the    | A1.1.1.1         |  |
| Negative Integer Exponents |                   | properties of exponents | A1.1.1.1.2       |  |
| Compound interest          |                   | to solve problems with  | A1.1.1.3.1       |  |
| Geometric Sequences        |                   | rational exponents.     | A2.1.2.1.1       |  |
| Nth Roots                  |                   |                         | A2.1.2.1.2       |  |
| Positive and Negative      |                   |                         | A2.1.2.1.3       |  |
| Rational Exponents         |                   |                         | A2.1.2.1.4       |  |
| Topics                     | Approx # of weeks | PA Standards            | A1.1.2.1.1       |  |
|                            |                   |                         | A1.1.2.1.2       |  |
| Composition of Functions   | 2 weeks           | CC.2.2.HS.D.8           | A1.1.2.1.3       |  |
| Inverses                   |                   | Apply inverse           | A2.1.3.1.1       |  |
|                            |                   | operations to solve     | A2.1.3.1.2       |  |
|                            |                   | equations or formulas   | A2.1.3.1.3       |  |
|                            |                   | for a given variable.   | A2.1.3.1.4       |  |
|                            |                   |                         | A2.1.3.2.1       |  |
|                            |                   | CC.2.2.HS.C.4           | A2.1.3.2.2       |  |
|                            |                   | Interpret the effects   |                  |  |
|                            |                   | transformations have    |                  |  |
|                            |                   | on functions and find   |                  |  |
|                            |                   |                         |                  |  |
|                            |                   | iuncuons.               |                  |  |

Standards Legend: Essential Important Supplementary