**HPC Topics for Cumulative:**

Trig Modeling

* Ferris wheel problems
* Oven Problem (past quiz)
* Brick and Bell Problem (past quiz)
* Entire worksheet starting with blood pressure problem

All Trig

* Graphing
* Solving trig equations and simplifying
* Inverse trig

Exponential and Log word problems and inverse problems

* Graphing exponential functions, graphing log functions, finding inverses of exponentials and logs (past quiz)
* Exponential growth problems (geometric sequence)

Conic Sections

* Graphing parabolas (all using geometric definitions)
* Graphing ellipses
* Graphing hyperbolas
* Converting equations to vertex form (completing the square)
* Shifted Earth application good practice
* Equations of tangent lines to ellipse (reflection property, 2 points close, limit def of derivative)
* Eccentricity
* Directrix of parabola and ellipse

Tangent lines

* Finding the slope of a tangent line by bringing two points very close and calculating slope
* Limit definition of a derivative
* Writing equations of tangent lines
* Connection to velocity and acceleration (past quiz)

Proofs

* Log proofs (product rule, quotient rule, power rule, change of base rule)
* Trig proofs (derive fundamental trig identity and the other two Pythagorean identities)
* Derivation of ellipse centered at (0,0), centered at (h,k)