**VAP #1**

Record a video that answers the following. Max time limit 3 minutes.

The function below is defined as:

$$f\left(x\right)=\left\{\begin{array}{c}-x^{2}+4x+1, \&x<3\\4(0.6)^{x-3}, \&x\geq 3\end{array}\right.$$

1. Estimate the limit, as approaches 3. In other words, 
2. Define . On the graph, draw horizontal lines to indicate the upper and lower boundaries of  and . Shade in this ‘error band’ lightly using color.
3. Using the graph, estimate to the nearest tenth the interval of values of around that will yield a result within the error band ( and ).
4. Using your results in (3), determine the maximum value of . In other words, how far away from can you be and still have a result within units of .
5. Repeat (2) – (5), this time graphing the function on your calculator.
6. Now we will determine algebraically. Set the pieces of the equation equal to  and , as appropriate and solve for . Use to determine . [suggestion: for time purposes, write out your algebraic solutions PRIOR to taking a video and **briefly** walk thru your solution steps.]
7. Finally, summarize by stating the formal definition of limits, inserting the values for this example.



