

# Frank Martino - Proof of Skills Analytical Calculations

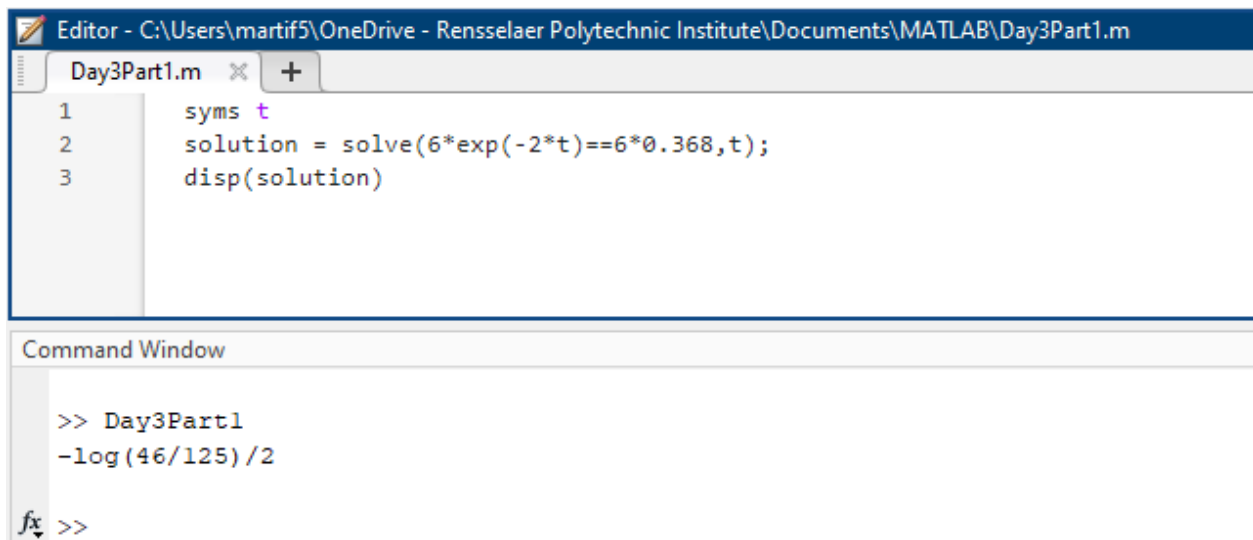
## Day 3

**Q3** Analytical Calculations with personal calculator (TI-XX) and MATLAB or equivalent

**Prove your skill set in using tools for analytical calculations.**

**Q3.2** Determine a time constant

**I can analytically determine a time constant for an exponential function**



```
Editor - C:\Users\martif5\OneDrive - Rensselaer Polytechnic Institute\Documents\MATLAB\Day3Part1.m
Day3Part1.m x +
1      syms t
2      solution = solve(6*exp(-2*t)==6*0.368,t);
3      disp(solution)

Command Window
>> Day3Part1
-log(46/125)/2
fx >>
```

Above is a screenshot of my Matlab program, where I first defined a symbol  $t$  to represent time. To solve for the time constant of an exponential function,  $6e^{-2t}$ , I used Matlab's solve function that has inputs: (equation, variable to solve for). The equation above is set equal to  $6 \cdot 0.368$  or  $6 \cdot (1/e)$ , the significance being that that is the proportion of the original value that would remain when  $t$  is equal to the time constant. After displaying the solution, I found  $t$  is  $-\log(46/125)/2$  or  $0.21708$ (unit of time).