**Registration#\_\_2019-EE-383**

University of Engineering & Technology Lahore

Experiment # 4

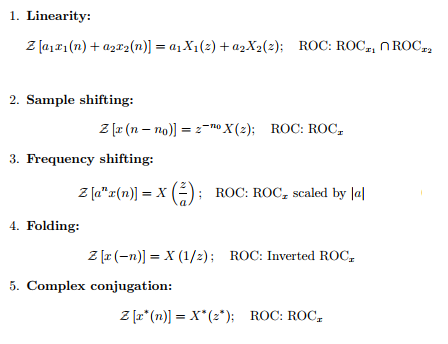
Title: Z Transform-I

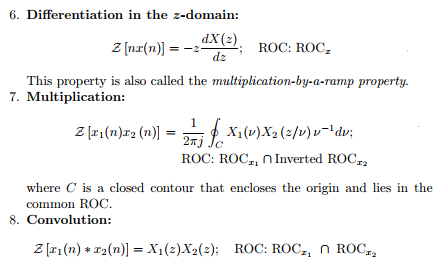
Equipment Required: Personal computer (PC) with windows operating system and MATLAB software

Theory:

Z transform is an important tool for the analysis and design of discrete time signals. It transforms a signal of time domain into a function of variable z. For discrete time signal x(n), z transform is defining as,

The properties of the z-transform are generalizations of the properties of the discrete-time Fourier transform.





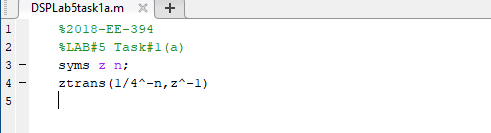
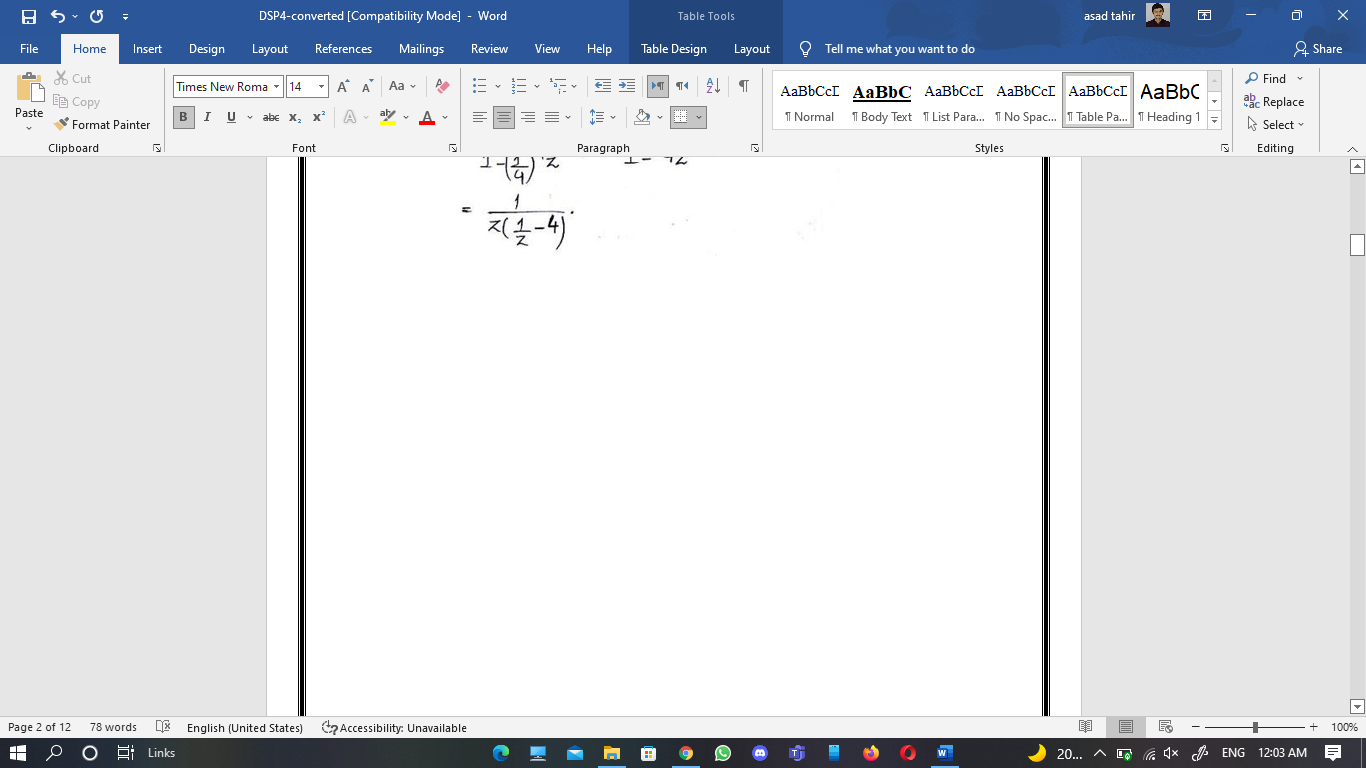
Example 1:

Find z transform of

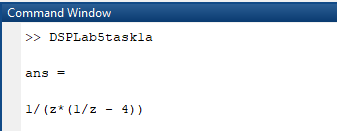
Task#01:

# i) 𝒙(𝒏) = (𝟏/𝟒)𝒏 𝒖(−𝒏).

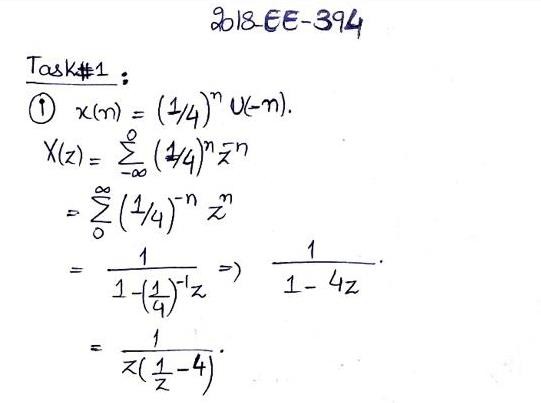
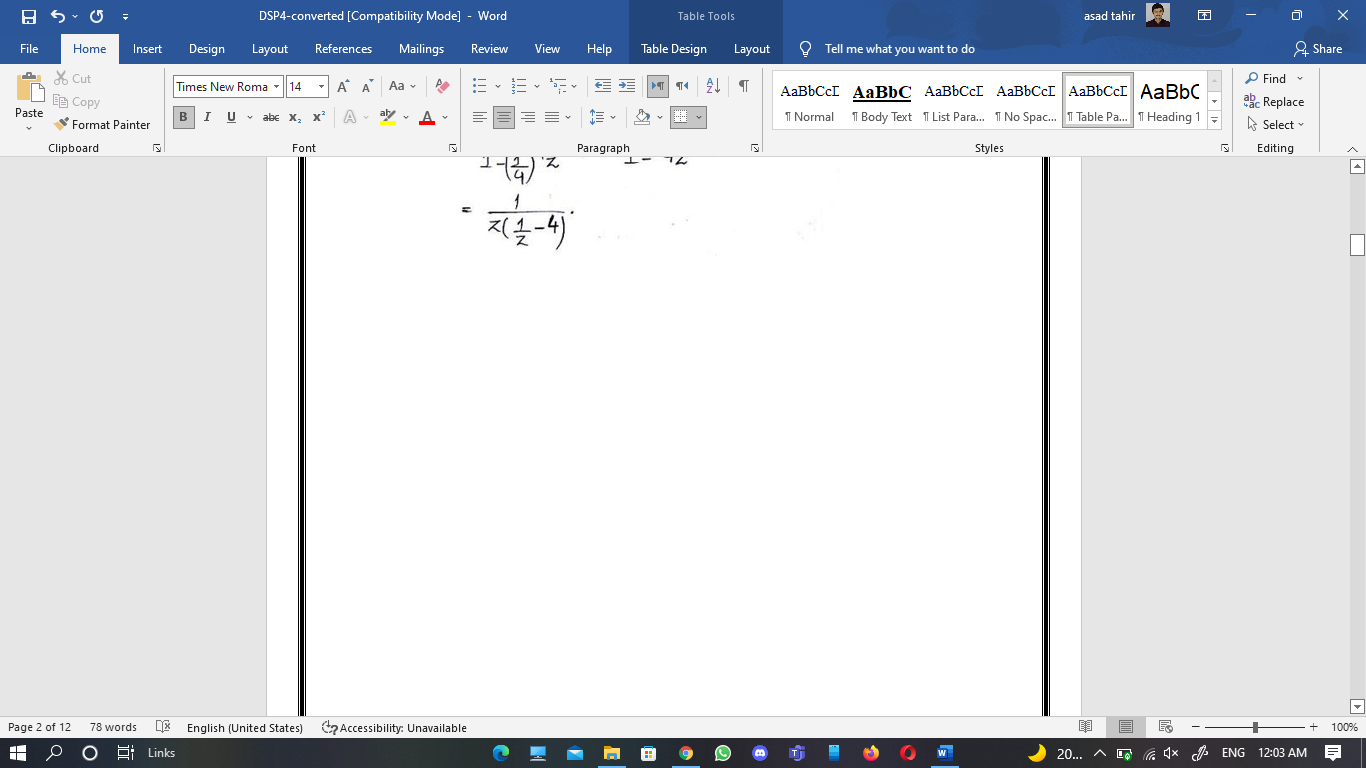
MATLAB Code:



Output:

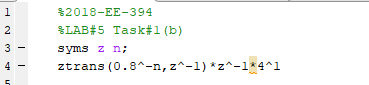
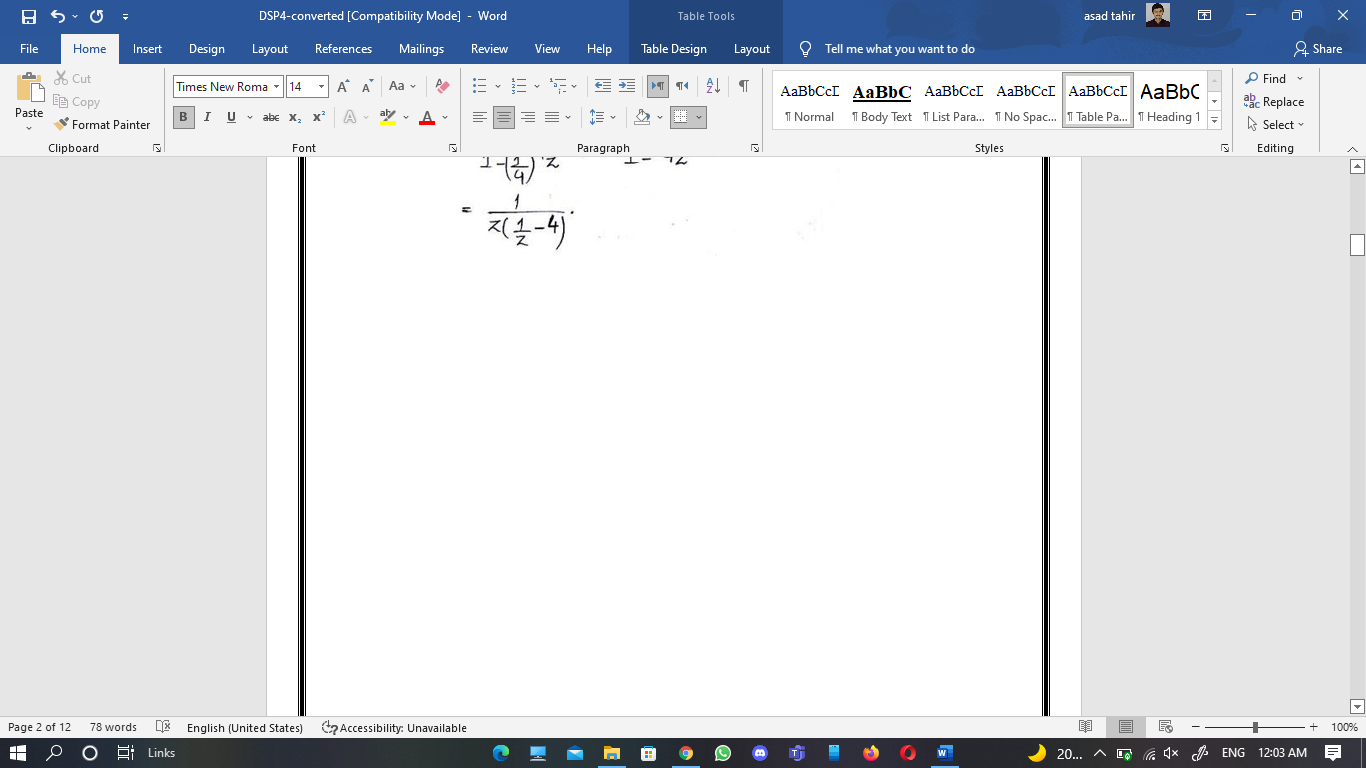


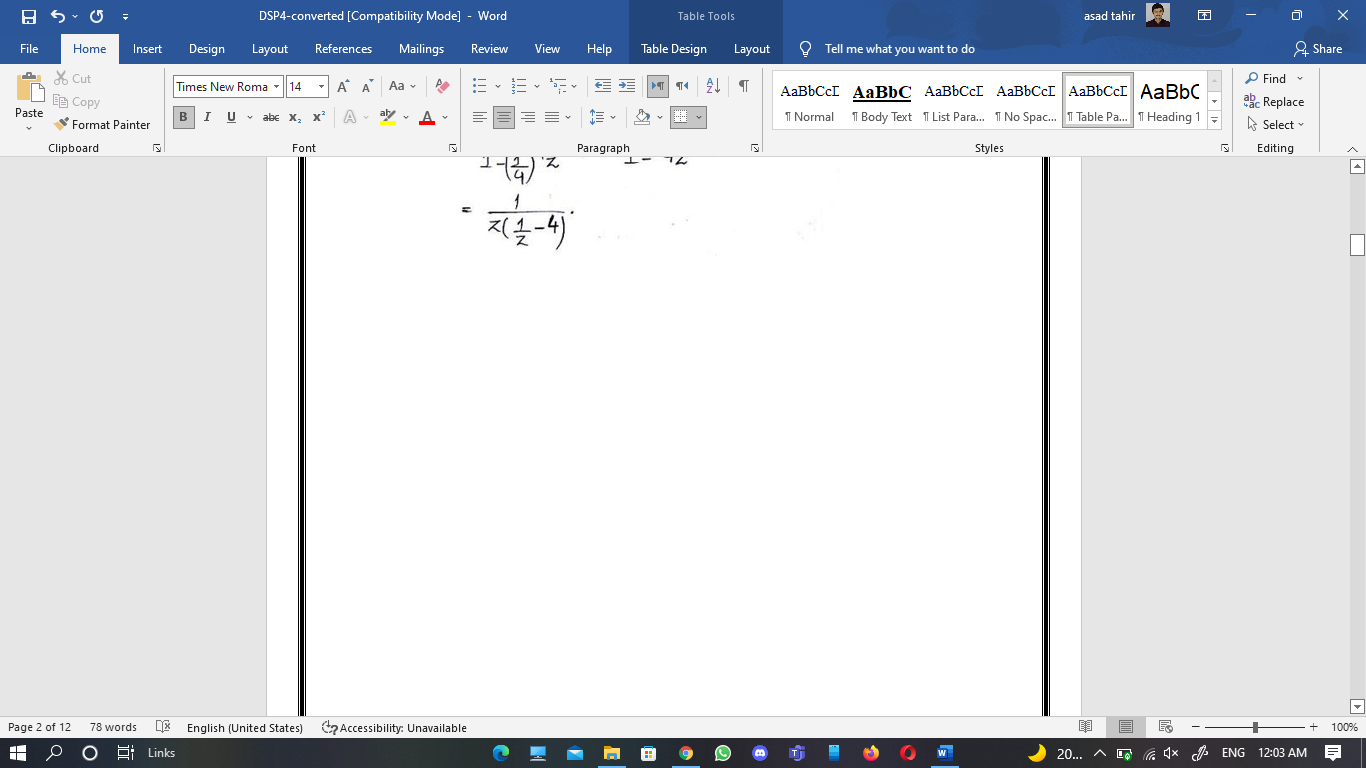
**Handwritten Solution:**

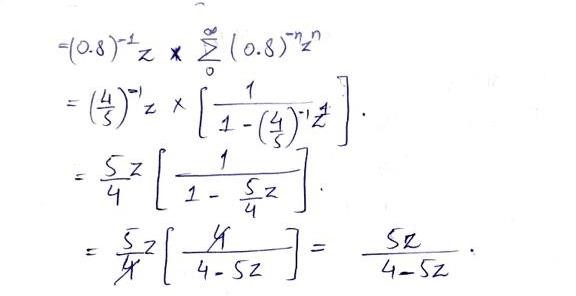
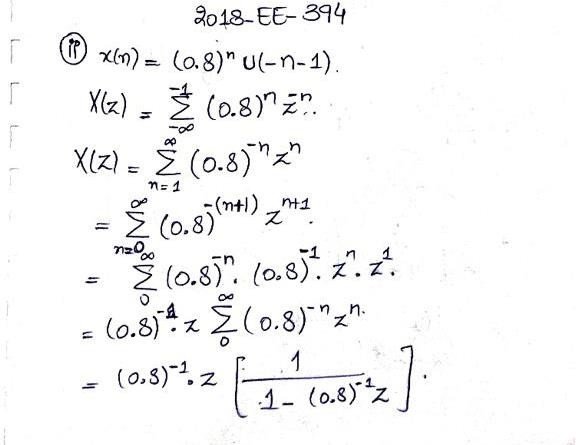


# 𝒊𝒊) 𝒙(𝑛) = (0.8)𝑛 𝑢(−𝑛 − 1).

MATLAB Code:

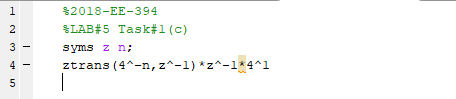
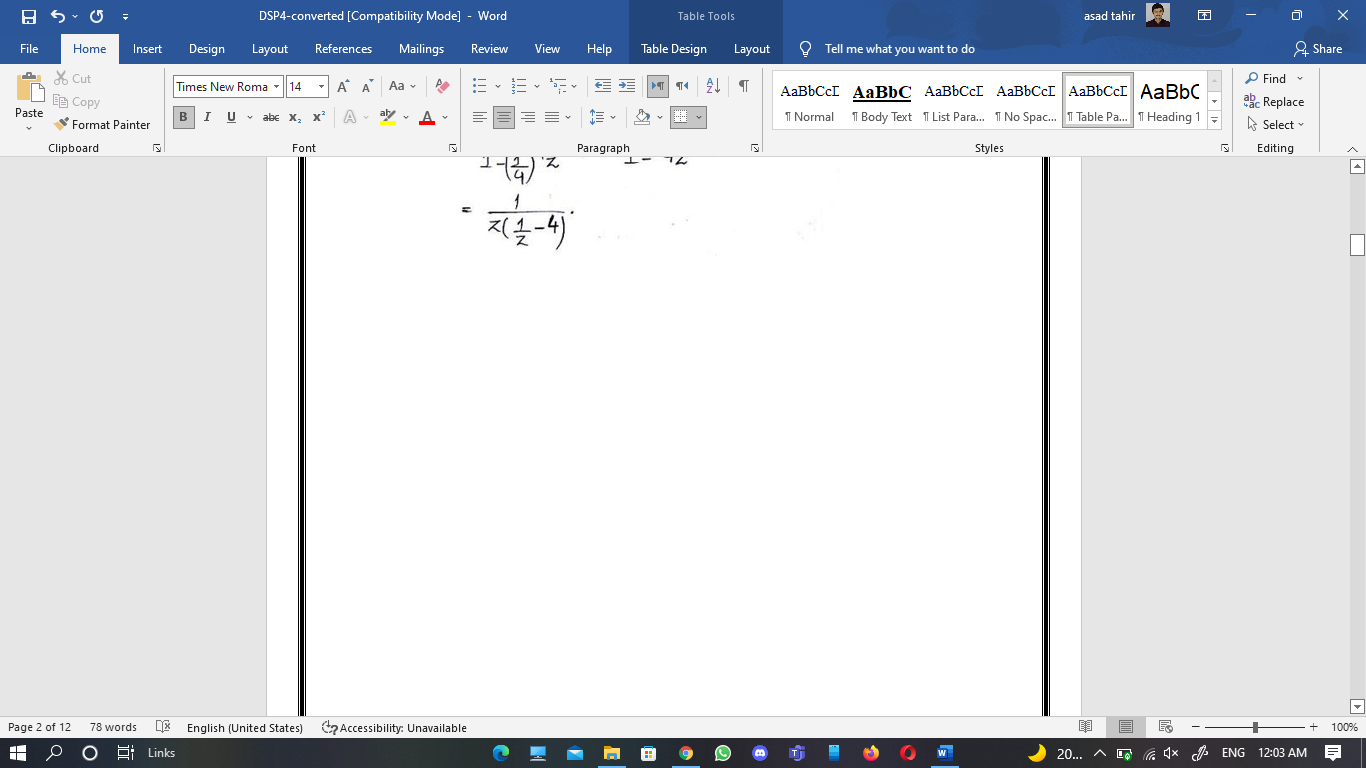


Handwritten Solution:

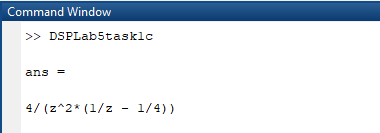


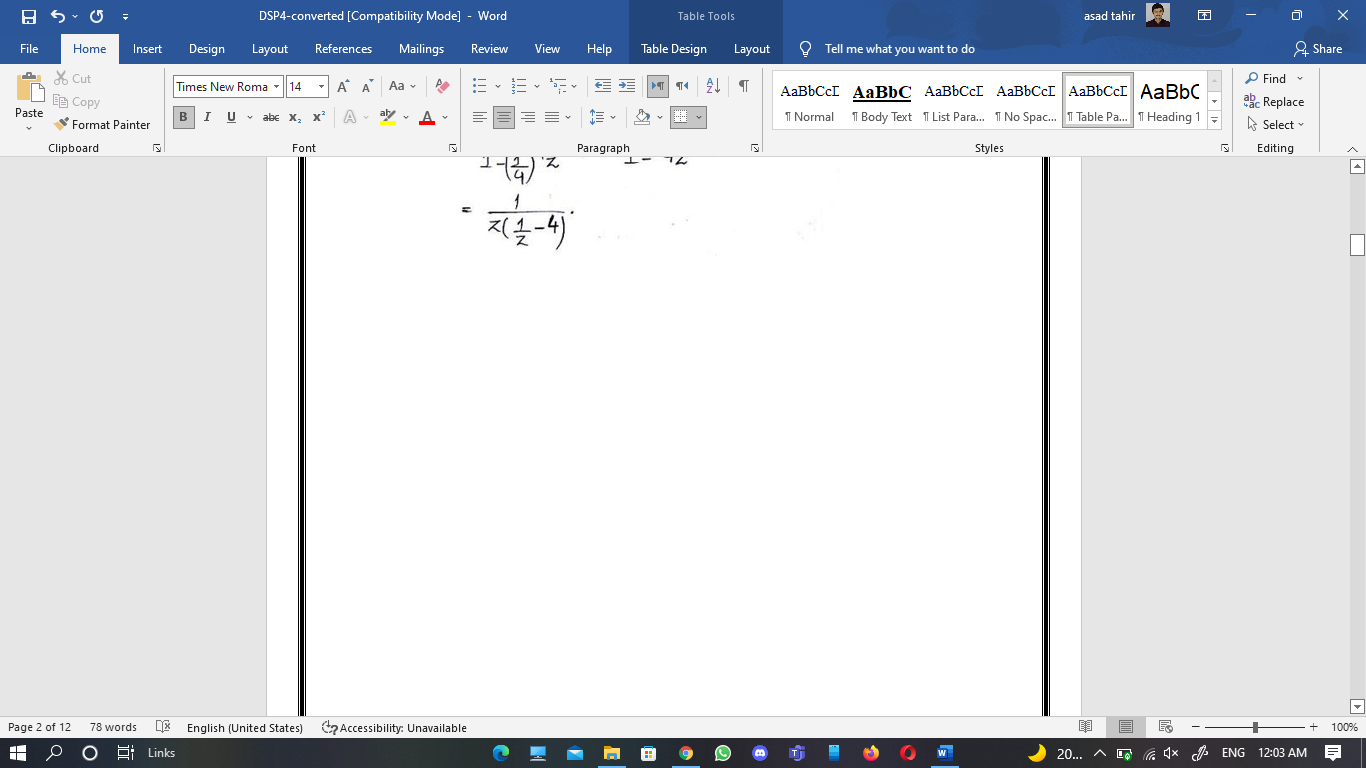
𝒊𝒊𝒊) 𝒙(𝒏) = (𝟒𝒏) 𝒖(𝟏 − 𝒏).

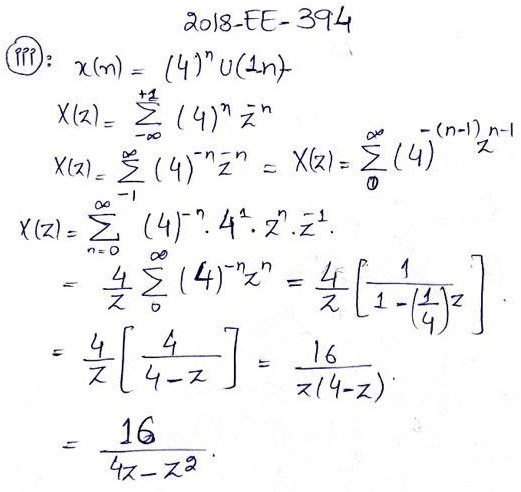
MATLAB Code:



Output:

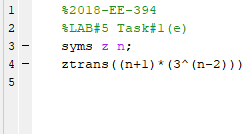
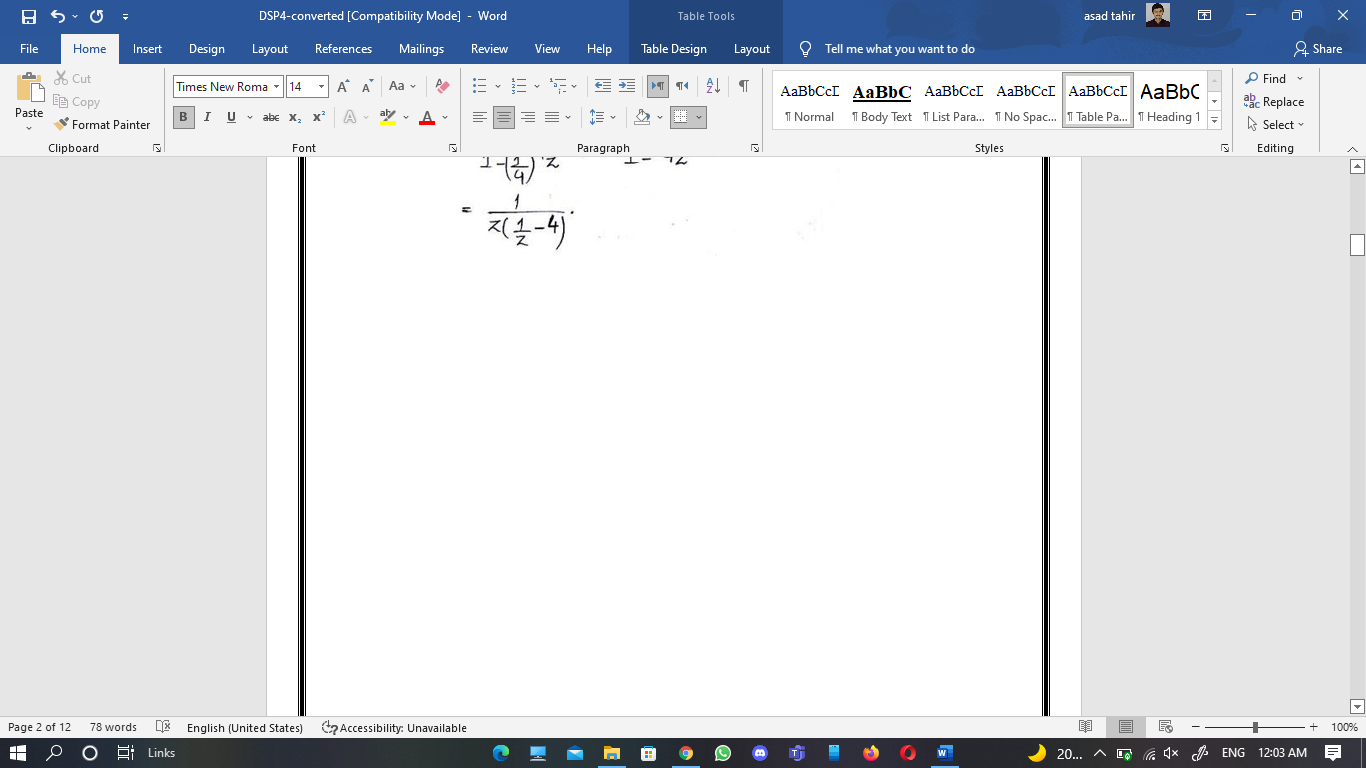


Handwritten Solution:

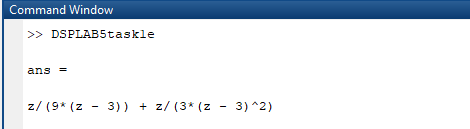


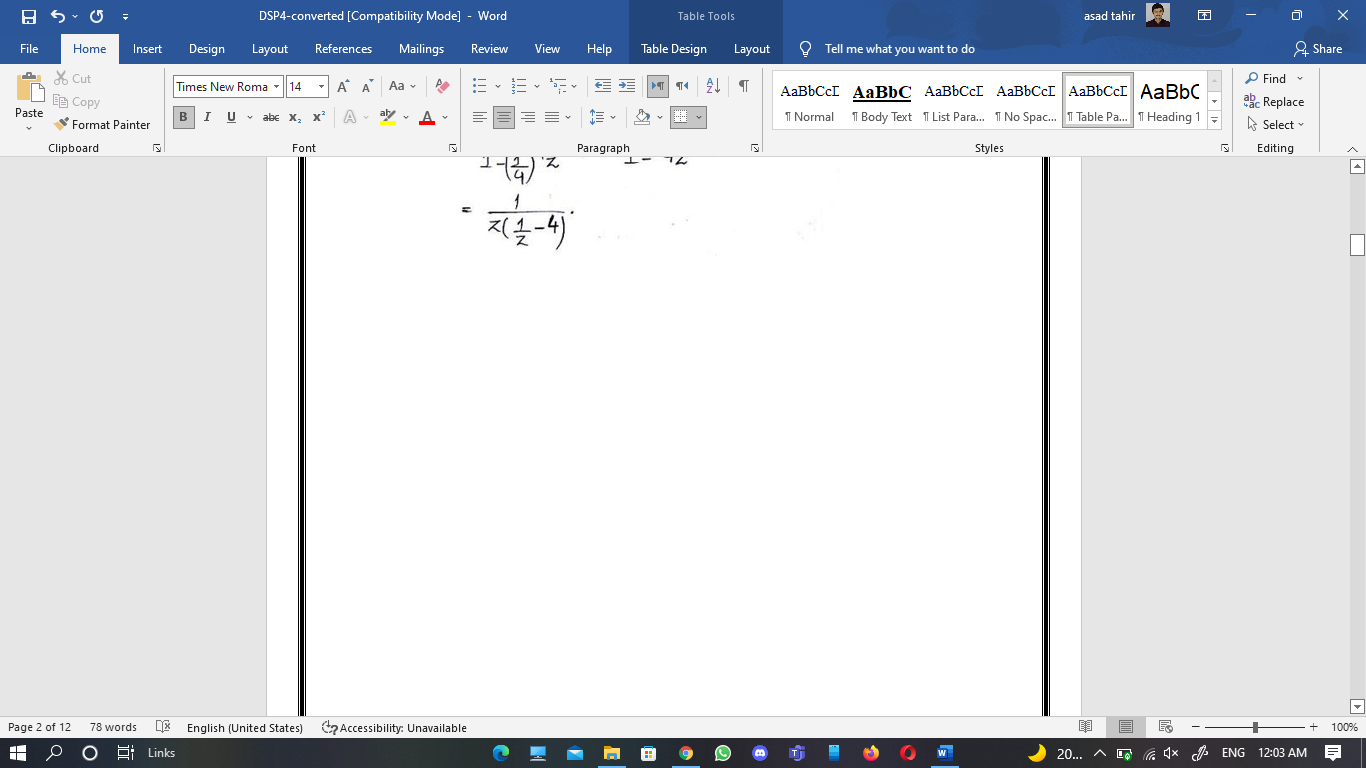
# 𝒊𝒗) 𝒙(𝒏) = (𝒏 + 𝟏)(𝟑𝒏−𝟐) 𝒖(𝒏).

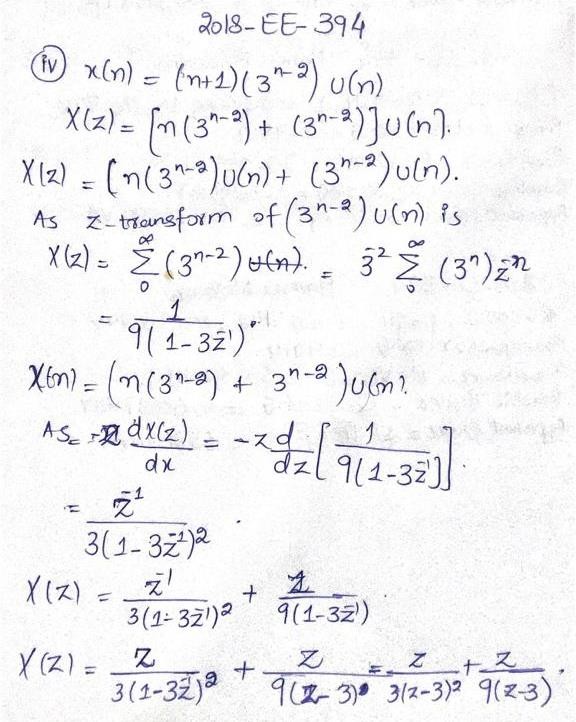
MATLAB Code:



Output:

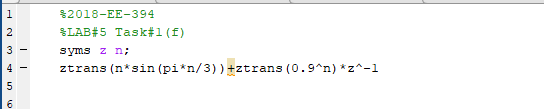
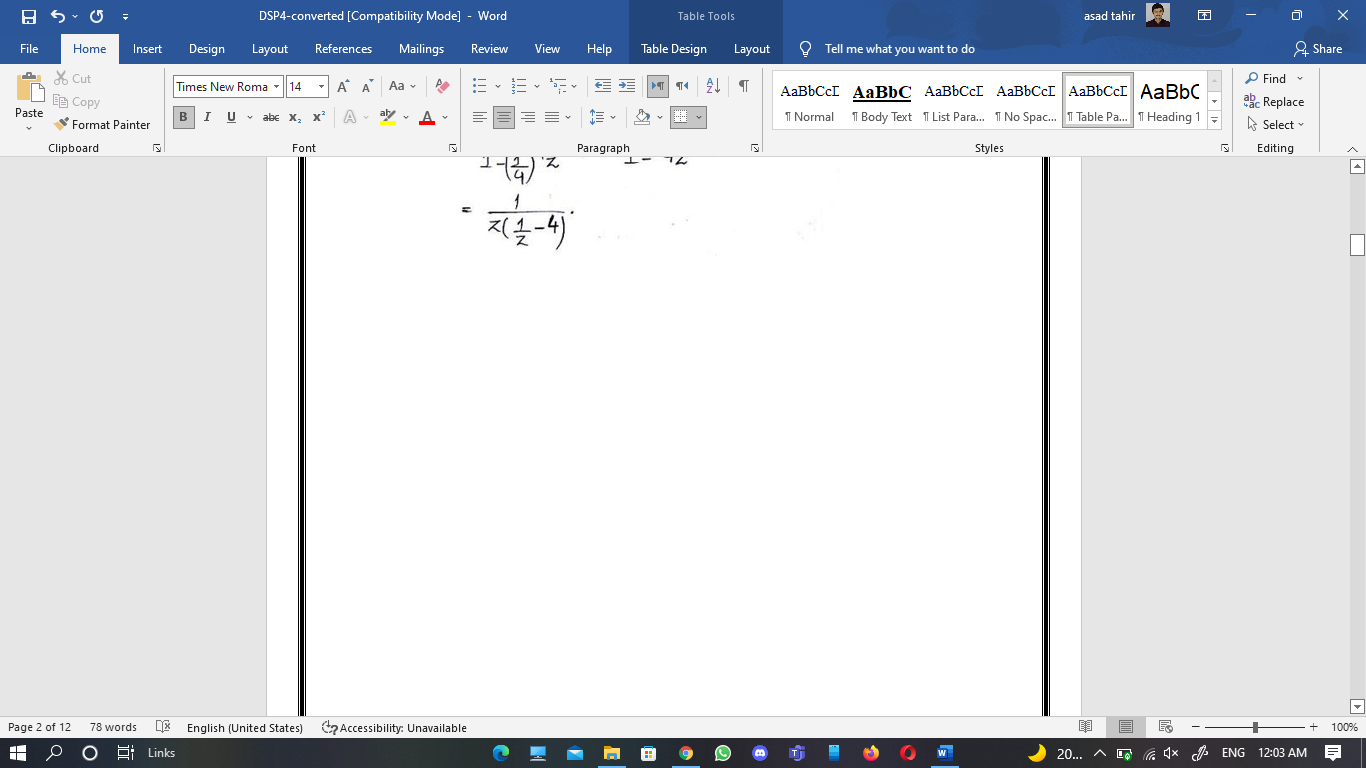


Handwritten Solution:

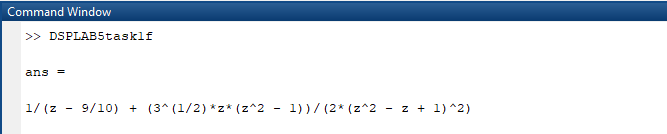


𝒗) 𝒙(𝒏) = 𝒏𝑺𝒊𝒏(𝝅𝒏/𝟑) 𝒖(𝒏) + (𝟎. 𝟗)𝒏 𝒖(𝒏 − 𝟏)

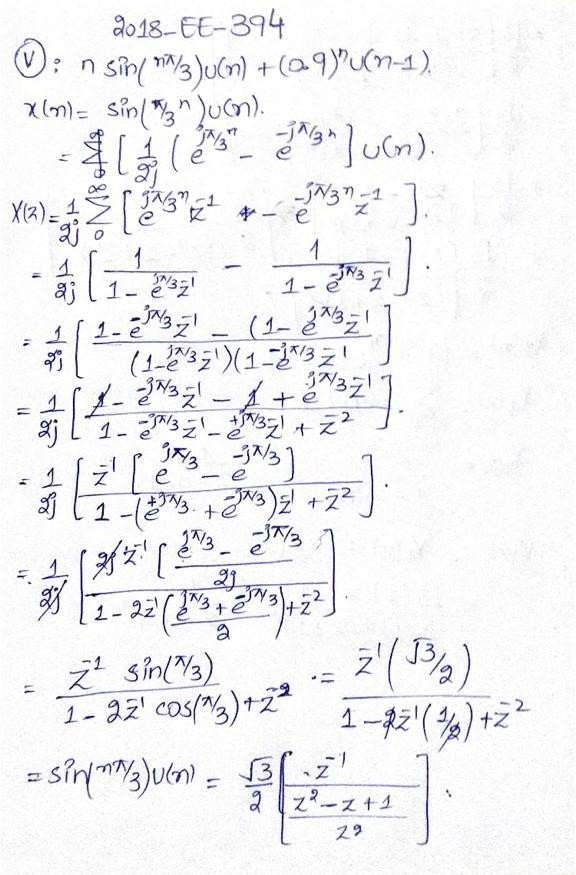
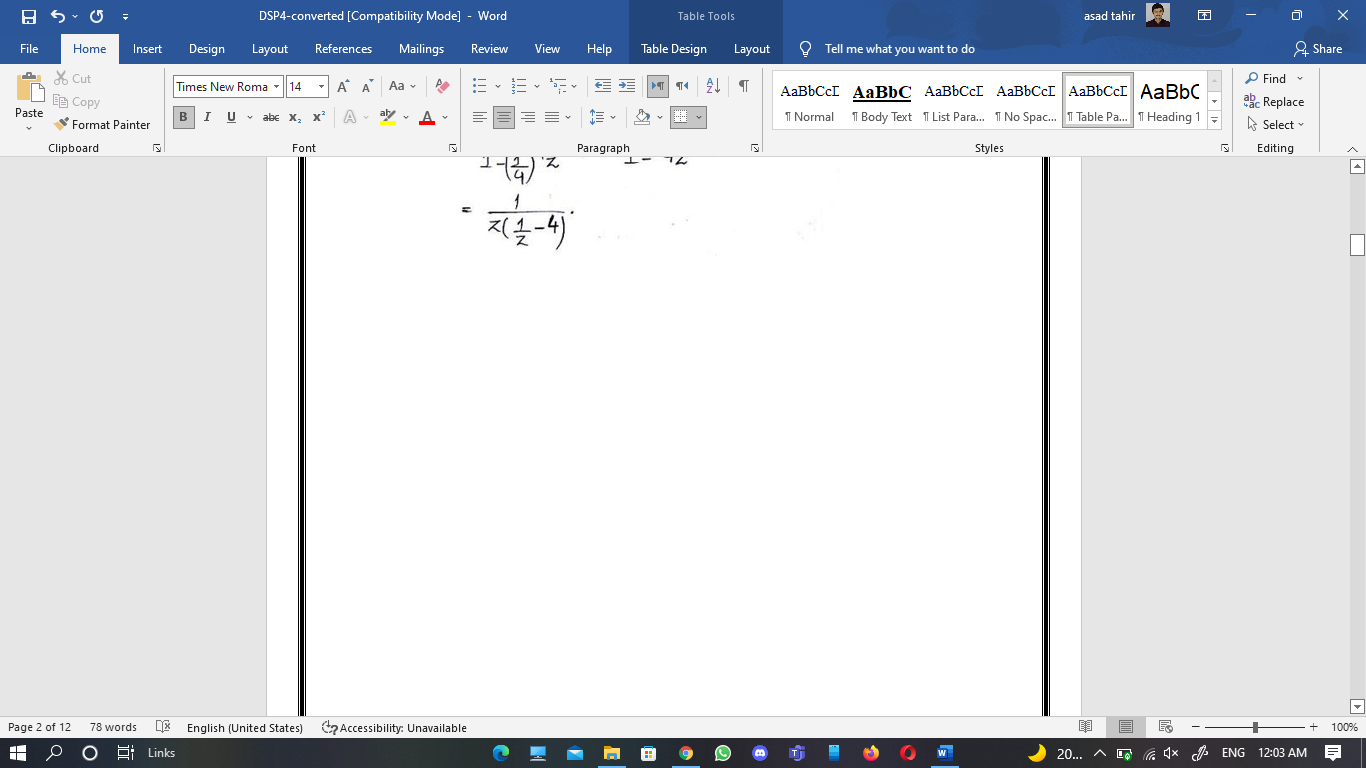
MATLAB Code:

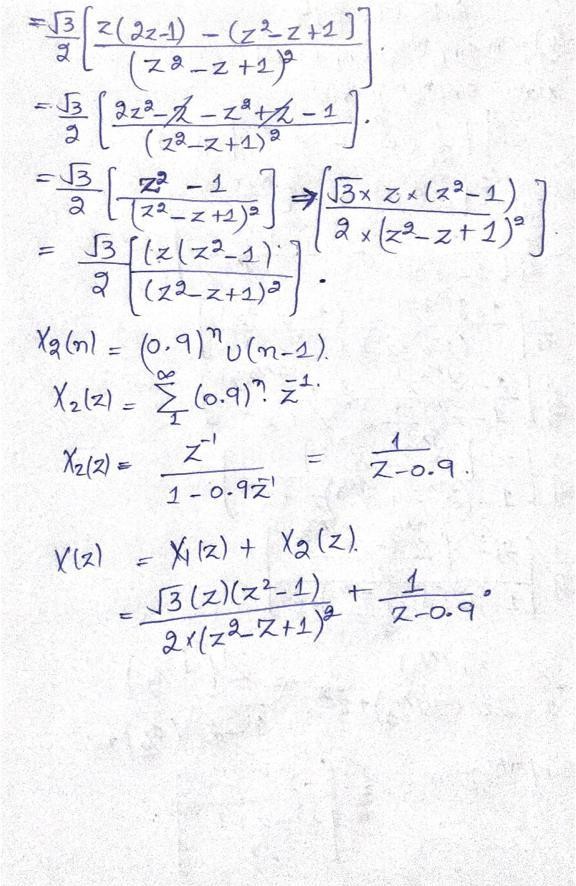


Output:



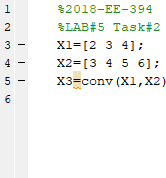
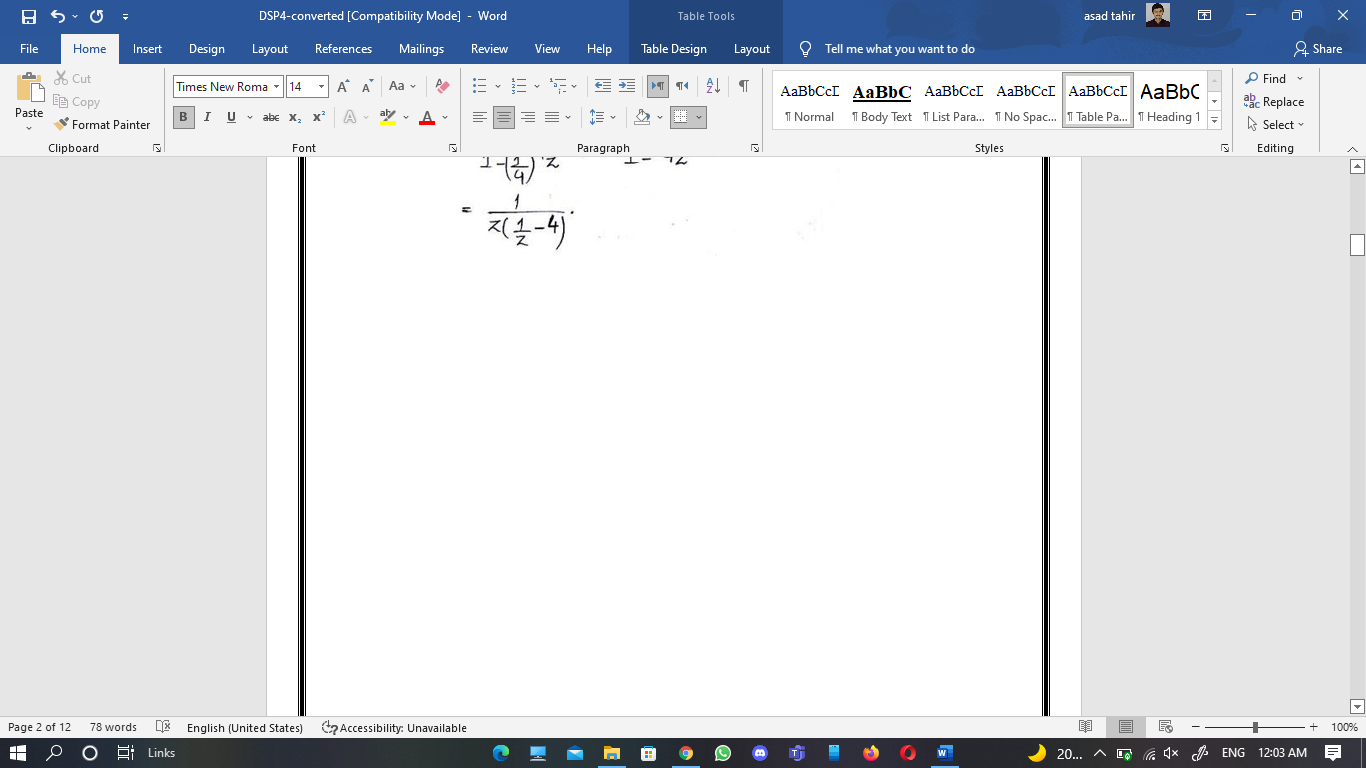
HandwrittenSolution:



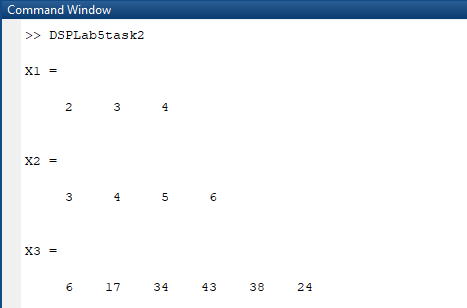


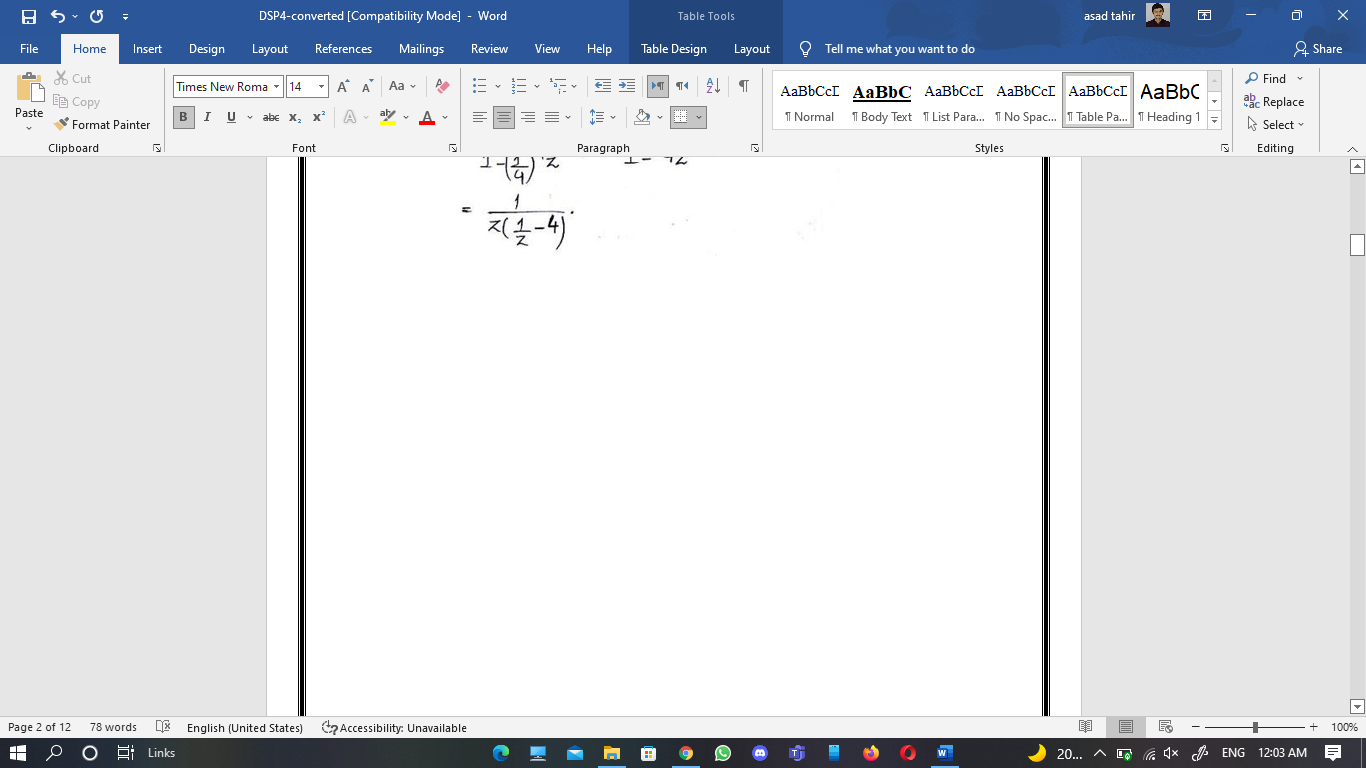
Task#02:

MATLAB Code:



Output:



Handwritten Solution:

