ELEC 425 Assignment 3

AUSTIN AMANN VAUGHAN 10101667

NOV 28TH, 2018

Question 1

The solution for question 1 is shown in Figure 1 below:

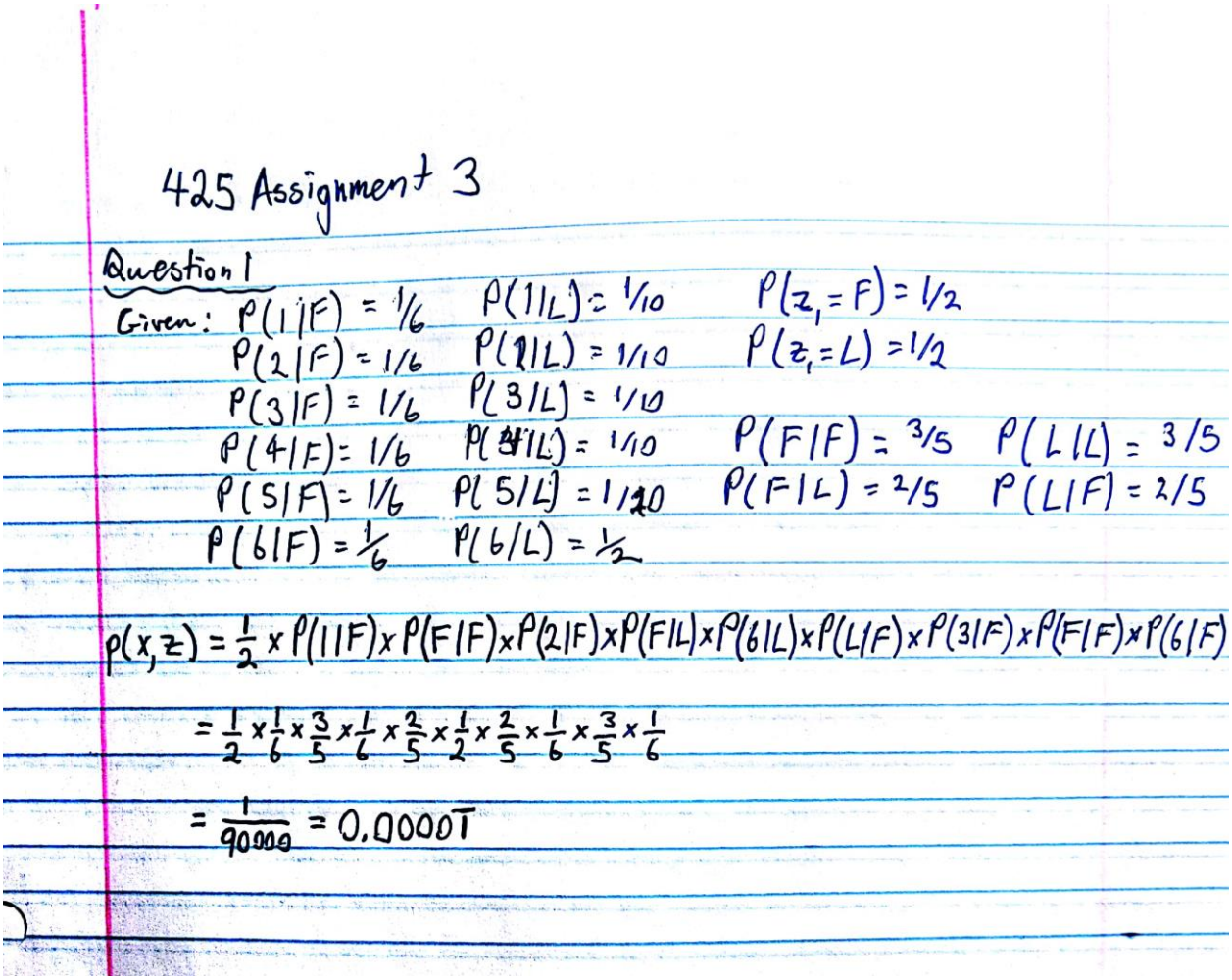

Figure 1

Question 2

The solution for question 2 is shown in Figure 2 below:

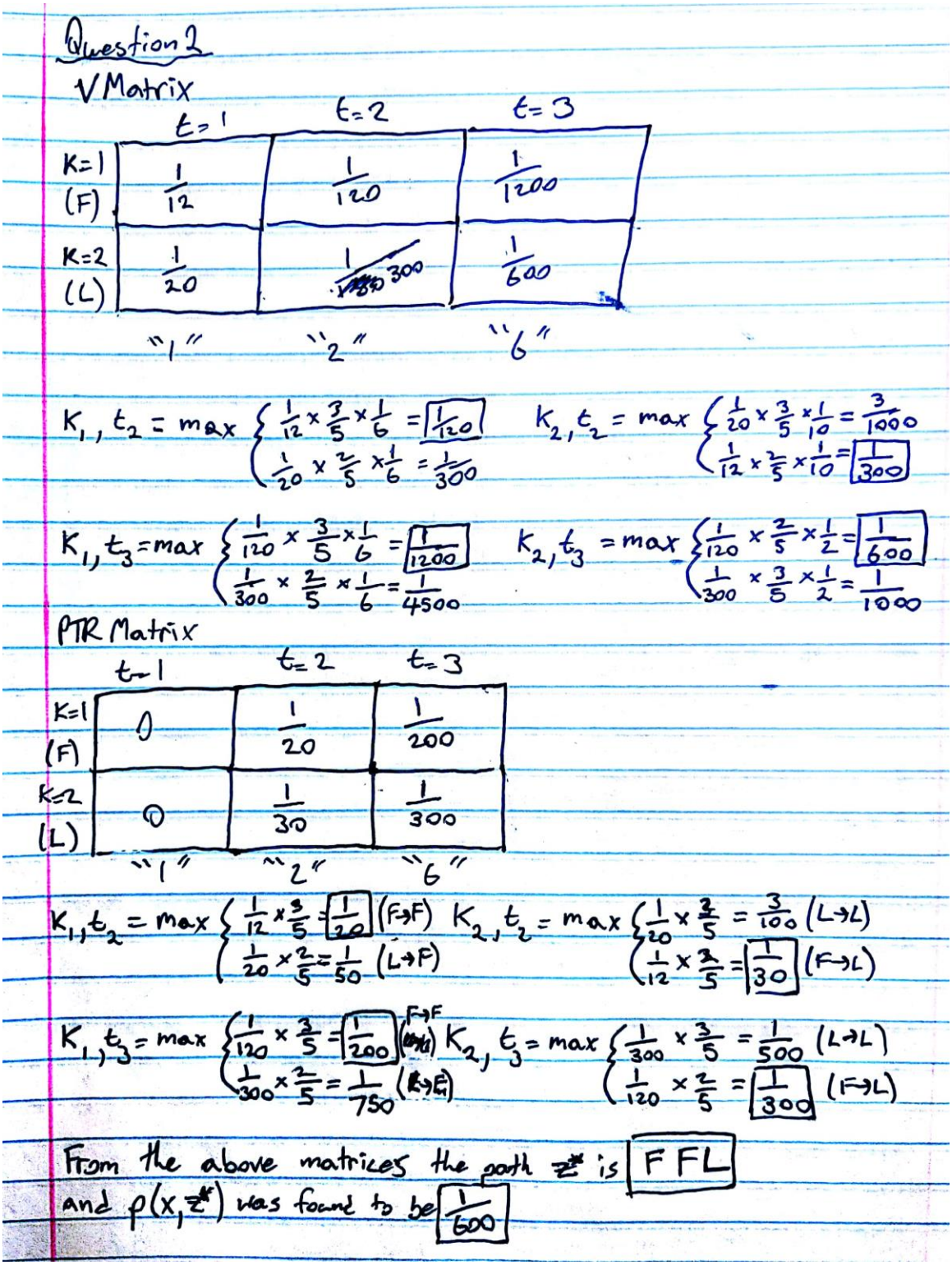

Figure 2

Question 3

The tanh activation function was implemented in activation_tanh.m, the function implemented was:

$$f(x) = \frac{2}{1 + e^{-2x}} - 1$$

The tanh gradient was implemented in activation_tanh_gradient.m, the gradient implemented was:

$$f'(x) = 1 - f(x)^2$$

feedforward_network_tanh.m was created as a modified version of feedforward_network_sigmoid.m where the activation function and gradient functions used were changed to be the newly created tanh activation and gradient functions shown above. The output of feedforward_network_tanh.m is shown in Figure 3 below:

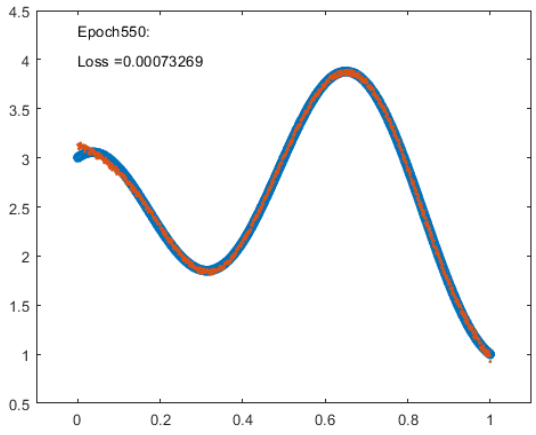

Figure 3

Out of curiosity I also ran feedforward_network_tanh.m with 2000 iterations to see if it completely converged on the provided wave. The output for 2000 iterations is shown in Figure 4 below:

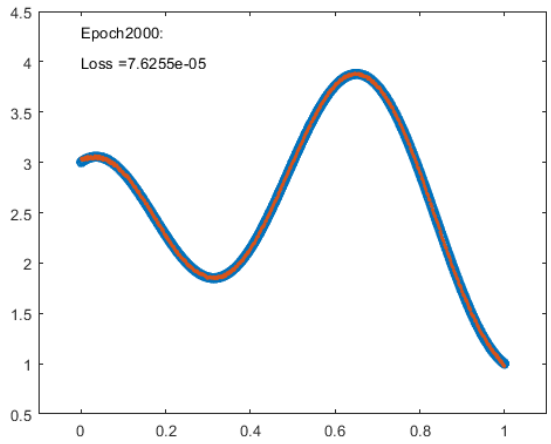

Figure 4