A graph with lines and dots

Description automatically generated

|  |  |  |  |
| --- | --- | --- | --- |
| Graph | Slope | Intercept |  |
|  | 0.010358825741654316 | 0.711125367785324 | 0.9981568036180684 |
|  | 0.009610110059066876 | -0.173242364444838 | -1.1396937010507142 |

Since the slope of the Vm vs motor speed graph gives us r\_m:

Measured Values from experiment:

Minimum PWM value = between 45-50

A graph with a line and a red line

Description automatically generated

Graphing Torque vs Motor Speed, the slope provides us with the dampening value, . The intercept provides us with the coulombic torque, .

|  |  |  |  |
| --- | --- | --- | --- |
| Graph | Slope () | Intercept () |  |
|  | 1.8688935357e-07 | 0.00022074990232 | 0.903840260594617 |

Therefore,

Using the following relationship, I created multiple Torque-Speed plots for different input voltages:

Since the X and Y intercepts of the Torque-Speed lines are known, we created the plots by solving for the X intercepts (when ) and Y intercepts (when ).

We had already solved all the variables in the equation from previous parts of the lab. After creating 3 different pairs of X and Y intercepts utilizing existing arrays for and the other variables, I plotted the points, and displayed them on the graph below:

A graph of different colored lines

Description automatically generated