ANSWER 1A:

UG should be between 0.002790 to 0.006278 rad-s^2-m^{-1}

ANSWER 1B:

Maximum steering sensitivity is 5.376344 s^{-1}

ANSWER 1C:

Steering wheel angles at 80 kph & 120 kph are 1.192725 rad & 0.530100 rad

ANSWER 2A:

Front Load (%)	Y_β *1e5 (N/rad)	Y_r*1e5 (N-s/rad)	Y_δ*1e5 (N/rad)	N_β*1e5 (N-m/rad)	N_r*1e5 (N-m-s/rad)	N_δ*1e5 (N-m/rad)
60%	-1.7840	0.0365	0.8920	0.4894	-0.2603	0.9788
50%	-1.7840	0	0.8920	0	-0.2502	1.2234
40%	-1.7840	-0.0365	0.8920	-0.4894	-0.2603	1.4681

ANSWER 2B:

Stability factor at 60% front load is 0.001431 rad-s^2-m^{-2}
Stability factor at 50% front load is 0.000000 rad-s^2-m^{-2}
Stability factor at 40% front load is -0.001431 rad-s^2-m^{-2}

ANSWER 2C:

Critical speed at 60% front load is (0.000000 + 26.431010 j) m/s (i.e. DOES NOT EXIST!)
Critical speed at 50% front load is (0.000000 + Inf j) m/s (i.e. DOES NOT EXIST!)
Critical speed at 40% front load is (26.431010 + 0.000000 j) m/s (i.e. 26.431010 m/s)

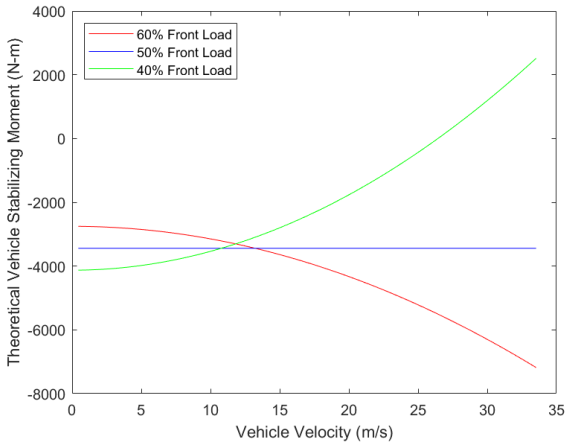
ANSWER 2D:

Distance from the neutral steer point to the front tire is 1.371533 m

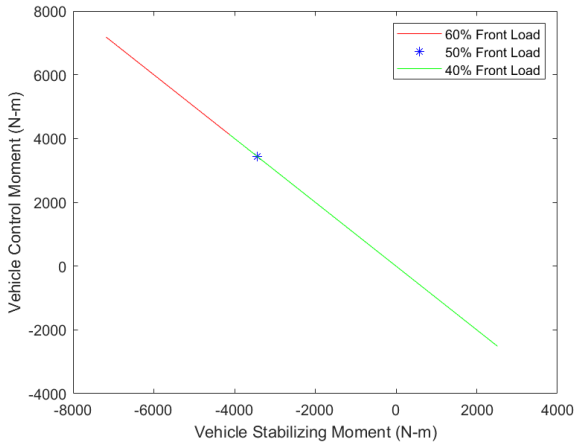
ANSWER 2E:

Stability factor at 60% front load is 0.100000
Stability factor at 50% front load is 0.000000
Stability factor at 40% front load is -0.100000

ANSWER 2F:

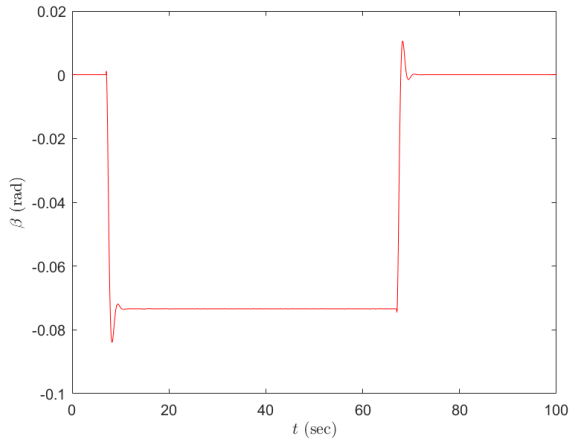


ANSWER 2G:

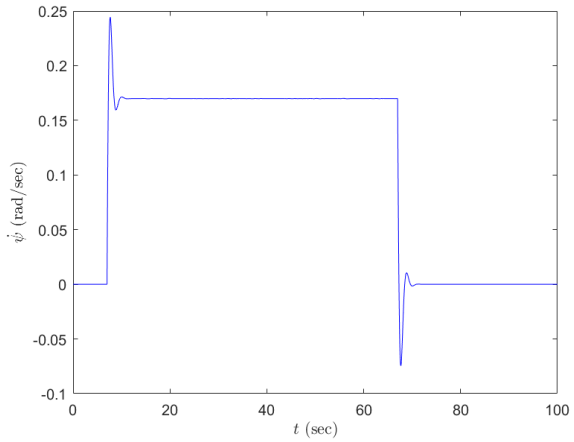


NOTE: Following results were obtained using MATLAB's ode45 nonstiff ODE solver, which is based on an explicit Runge-Kutta (4,5) formula, the Dormand-Prince pair.

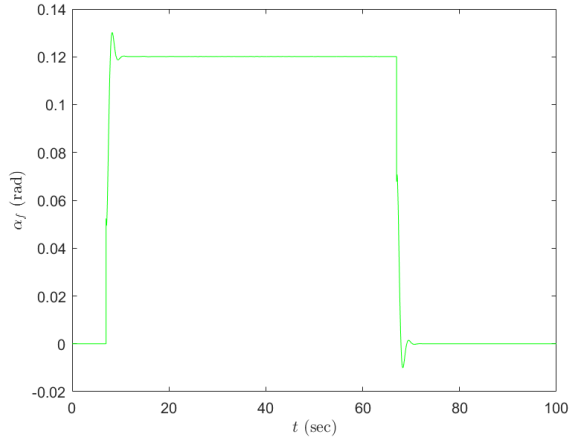
ANSWER 3A:



ANSWER 3B:



ANSWER 3C:



ANSWER 3D: