1) Braking. (These aren’t meant to be tricky, so don’t over-analyze)
   a) Suppose you are traveling at 60mph on the highway and you notice an 
      unexpected road block. If your reaction time is 0.4s, how long do you travel 
      before you begin to brake? If braking follows immediately at 0.9g, how long 
      do you travel before you stop? What if only 0.5g is possible due to road 
      conditions? 0.3g?
   b) Assuming the parameters from problem 2, what braking force is required to 
      decelerate the vehicle at 0.5g. Simulate the car braking at 0.5 g and compare 
      the stopping distance to what was predicted in part a. Now add air-drag and 
      rolling resistance – what is the stopping distance (show plots).
   c) A fully loaded cement truck weighing 66,700 pounds took 430 feet to stop. 
      What deceleration does this correspond to from an initial speed of 78 mph and 
      what is the peak friction coefficient? What about from 68 mph?
   e) Let’s say that your car has a cg height of 0.5m, a wheelbase of 2.5m and a 50- 
      50 weight balance between the front and rear. If the tire/road interface has a 
      peak friction coefficient of 0.9, you have no ABS system and you want to 
      avoid locking the wheels, what peak deceleration can you achieve if you have 
      ideal proportioning? If you have no proportioning?

2) Download the braking data from the website. Assume the effective radius of the wheel 
   is 0.35 m.
   a) For the first set of data, plot the GPS Velocity and Tire Velocity (“hold on”) on 
      the top half of a page (“subplot(2,1,1)”). Plot tire slip vs time on the bottom 
      half of the page (“subplot(2,1,2)”). Any ideas what the “blip” in the data is due 
      to?
   b) For the second set of data, plot tire slip vs. time. Then plot the tire slip vs. 
      Force (mass of the car in 1500 kg). Estimate the tire’s longitudinal stiffness.