

**P5.1-2)** A RWD 2011 Corvette Coupe, starting from rest, accelerates from 0 to 60 mph in 4.5 seconds. The car's technical specifications are listed below. Assuming that the air drag is constant and equal to 100 lb, what is the car's traction force? Assuming that the car has enough engine power to accelerate at this same rate for 10 seconds, determine the distance traveled by the car in 10 seconds. Assume that the front wheel rolling friction is negligible. The car's configuration is as follows: curb weight = 3175 lb, wheel base = 105.7 in, rear wheel drive and weight distribution = 51/49 f/r (%). Assume that you can treat the car as a particle.



Given:

Find:

Solution:

**Draw a free-body diagram of the car.**

**Determine the car's tractive force.**

Write down the car's equation of motion.

$$F_{\text{tractive}} = \underline{\hspace{10em}}$$

**Find the car's acceleration.**

**Use Kinematics to determine the distance traveled.**

$$a = \underline{\hspace{10em}}$$

$$\Delta s = \underline{\hspace{10em}}$$