Assignment #1 - VGP200

- A car accelerates from rest at a rate of 2 m/s².

 How long does it take to reach the speed of 30 m/s?
- 2. How far has the car in problem 1. traveled by the time it has reached the speed of 30 m/s?
- 3. According to Wikipedia, the 2006 Renault R26) accelerates at the following rates:

• 0 to 100 km/h: 1.7 seconds

0 to 200 km/h: 3.8 seconds

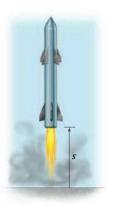
0 to 300 km/h: 8.6 seconds

Compute the average accelerations of this car as it goes from 0 to 100 km/hr, from 100 km/hr to 200 km/hr and from 200 km/hr to 300km/hr. Provide your answer in SI units.

In each case, how many g's does the driver experience? $(1g = 9.8 \text{ m/s}^2)$

- 4. An object is dropped from a certain height and hits the ground with speed 20 m/s.
 - a) From what height was it dropped?
- b) How fast is it going when it is 5m from ground?
- An object is launched at a 50° angle measured upward from level ground, with initial speed 40 m/s.
 - a) How long does it spend in the air?
- b) How far does it go horizontally?

The acceleration of a rocket traveling upward is given by $a = (6 + 0.02s) \text{ m/s}^2$, where s is in meters. Determine the rocket's velocity when s = 2 km and the time needed to reach this attitude. Initially, v = 0 and s = 0 when t = 0.



Prob. 12-19

A train starts from rest at station A and accelerates at 0.5 m/s² for 60 s. Afterwards it travels with a constant velocity for 15 min. It then decelerates at 1 m/s² until it is brought to rest at station B. Determine the distance between the stations.

A golf ball is struck with a velocity of 80 ft/s as shown. Determine the distance d to where it will land.

