



HW 1 Solution: ME-392: Mechanics Fall 1427/1428 (27-2)

Problem 1: Your car maximum speed is 220 km/hr; find the maximum speed in:

- b. m/s^2
- c. mile/hr
- d. yard/s

Solution

- a. 1 km = 1000 m
1 hr = 60 min = 3600 s

$$220 \frac{km}{hr} = 220 \frac{km}{hr} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ hr}}{3600 \text{ s}} = 61.11 \text{ m/s}$$

- b. 1 mile = 1.6 km

$$220 \frac{km}{hr} = 220 \frac{km}{hr} \times \frac{1 \text{ mile}}{1.6 \text{ km}} = 137 \text{ mile/hr}$$

- c. 1 yard = 3 ft = 3 (0.305 m) = 0.915 m

$$61.11 \frac{m}{s} = 61.11 \frac{m}{s} \times \frac{1 \text{ yard}}{0.915 \text{ m}} = 66.79 \text{ yard/s}$$

Problem 2: If you drive at a constant of speed of 40km/hr for a distance of 10 km, how many minutes will it take you to reach your destination?

Solution

$$time_h = \frac{\text{distance}}{\text{speed}} = \frac{10 \text{ km}}{40 \text{ km/hr}} = 0.25 \text{ hr}$$

$$time_{min} = 0.25 \text{ hr} \times \frac{60 \text{ min}}{1 \text{ hr}} = 15 \text{ min}$$

Problem 3: Decide which of the following quantities is vector (V) or scalar: Velocity, Density, Speed, Force, Displacement, Temperature.

Solution

Vector: Velocity, Force, Displacement.

Scalar: Density, Speed, Temperature.