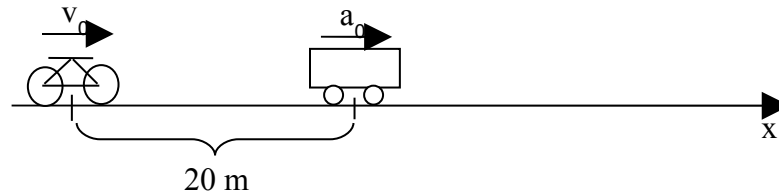


A motorist is moving with constant velocity of v_0 towards a car which is initially at rest. At $t=0s$, when the motorist is at a distance of 20 m away from the car, the car starts moving with a constant acceleration of a_0 away from the motorist. The motorist catches up with the car after the car travels a distance of 10 m in 2 seconds . Answer the following questions considering the x-axis shown in the sketch below.



- What is a_0 and the average velocity of the car within the 2 s time interval?
- What is v_0 ?
- Consider that the motorist and the car do not change their motion after they meet. At what time will the motorist and the car meet for a second time?
- At what time is the distance between the motorist and the car maximum, between $t=2\text{ s}$ and the time at which the motorist and the car meet for the second time? What is the distance between the car and the motorist at this time?
- Consider that the motorist and the car do not change their motion after the second time they meet. At what time is the distance between the motorist and the car 60 m ? Is the motorist or the car leading at that time?