**Answer on question #64479, Physics / Mechanics | Relativity**

**Question**  A racing car, moving with constant acceleration along a straight stretch of track, passes a fixed marker A with speed of 72 km/h. Two seconds later it passes a second fixed marker B. Given that the distance AB is 45 meters, find the acceleration of the car.

A third marker C is situated near the end of this section of track. Given that the speed of the car as it passes C is 216 km/h, find the time taken by the car to travel from A to C.

**Solution**  Lets write down equation of motion for these 2 sec:

$$s = v_0 t + at^2/2$$

We know that $v_0 = 72 km/h = 20 m/s$, $s = 45$ m and $t = 2$ sec. So we can find acceleration:

$$a = 2\frac{s - v_0 t}{t^2} = 2\frac{45 - 20 \cdot 2}{2^2} = 2.5\,m/s^2$$

Time that is needed to travel to C can be found as

$$v = v_0 + at$$

$$t = \frac{v - v_0}{a} = \frac{60 - 20}{2.5} = 16\,s$$