Answer on Question #45943, Physics, Mechanics | Kinematics | Dynamics

You are to drive to an interview in another town, at a distance of 320 km on an expressway. The interview is at 11:15 a.m. You plan to drive at 100 km/h, so you leave at 8:00 a.m. to allow some extra time. You drive at that speed for the first 110 km, but then construction work forces you to slow to 42.0 km/h for 44.0 km. What would be the least speed needed for the rest of the trip to arrive in time for the interview?

Solution

You have 3.25 hours to get to interview. On first 110 km you spend 1.1 hour, because

$$t_1 = \frac{S_1}{v_1} = \frac{110}{100} = 1.1\,h$$

On slowed down 44 km you spend

$$t_2 = \frac{S_2}{v_2} = \frac{44}{42} \approx 1.05\,h$$

And you are left with

$$3.25 - 1.1 - 1.05 = 2.1\,h$$

to pass distance of

$$S = 320 - 110 - 44 = 166\,km$$

Hence, your least speed should be

$$v_3 = \frac{S_3}{t_3} = \frac{166}{2.1} \approx 79.05\,km/h$$