The Tortoise and the Hair

$$a = \frac{\Delta v}{t} = \frac{v_f - v_i}{t}$$

1) "Take your mark. Runners ready…SET!" BANG. The gun went off and before the smoke cleared the hair was off and running. The hair reached a velocity of 30 m/s in 6 sec. What was the hair's acceleration?

2) The tortoise also took off at the sound of the gun, but only reached 10 m/s in the same amount of time. What was the tortoise's acceleration?

3) As per story, the hair gets out to an early lead and decides to take a snoozer, only to be awoken by the tortoise trudging along. The hair jumps up and begins to accelerate at a rate of 4 km/hr/s for 12 seconds. How fast will the hair be going after the 12 seconds?

4) The hair regains a substantial lead and jogs at a constant speed of 30 km/hr. He checks behind him and realizes that he cannot even see the tortoise and slows to 5 km/hr and conserve his energy. If he decelerated at a rate of -6km/hr/s, how long should it take him get to the 5 km/hr walk?

5) Thinking he has more time than he does, the hair decides to wash himself in a nearby pond. While on his second rinse the turtle again takes the lead. This time the hair takes off with a jog of 4 m/s while he dries himself with a towel. He tosses his towel to an adoring fan and takes off with an acceleration of $3m/s^2$. How fast is the hair moving after 2 minutes?

6) After running and passing the tortoise once again the hair can't stop itching himself. He has lice and now needs to delouse himself. While delousing, the tortoise takes the lead for the last time. The hair realizes that he has lost the race and walks at 4 m/s towards the finish line with his head down. Not wanting to disgrace his fans, he picks up his speed at a rate of $6m/s^2$. How long would it take the hair to reach a respectable speed of 40 m/s?

7) Fill in the missing information on the speedometers below.