Instantaneous and average speed

Objects around us often change the speed of their motion. It is important to distinguish the following two terms:

Instantaneous speed tells you how fast an object moves *right now*, at specific time t. The formula is the same as usual, but **t must be as small as possible:**

$$v = \frac{d}{t}$$

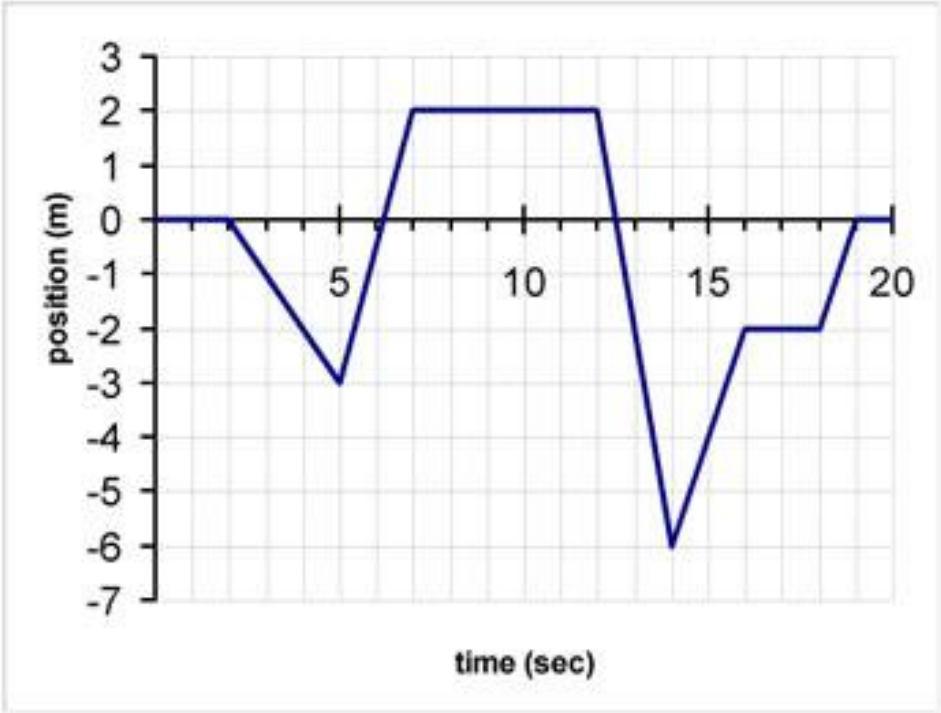
Average speed tells you how fast an object moves on average. To find it you only need to know the total distance that an object travelled and the total time it took:

$$v_{avg} = \frac{\text{total } d}{\text{total } t}$$

Homework 5

Problem 1.

The figure below shows the position of a sloth crawling back and forth along a straight line. Find its instantaneous speed at each time interval, copy the table below to your answer sheet and fill it out. Also, find the average speed of the sloth (you'll need to figure out the total distance travelled for this).



Time interval, s	Speed, m/s
0-2	
2-5	
5-7	
7-12	
12-14	
14-16	
16-18	
18-19	
19-20	
Average (0-20)	

Problem 2

Two speed climbers are racing an Audi car to the top of a mountain. The climbers can go in a straight line from the bottom to the top of the mountain, which has a height of 1,200ft. The climbers average a speed of 0.17ft/s. The car has to go through narrow sinuous roads, so its average speed in the race is 29.3mph. The road to the top of the mountain is 60 miles long. Who will win the race, the climbers or the car? By how much?

Once you have made your prediction, you can watch the race take place at https://www.youtube.com/watch?v=xKLsBk5CijQ