Physics I

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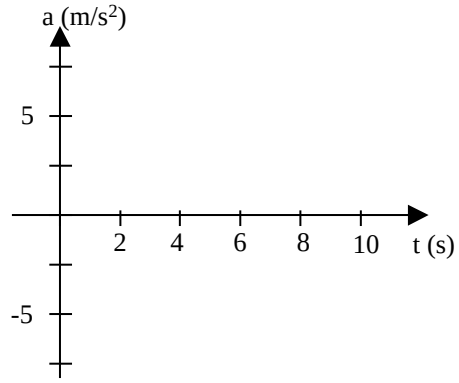
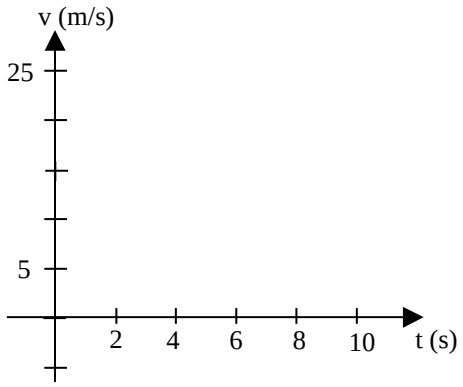
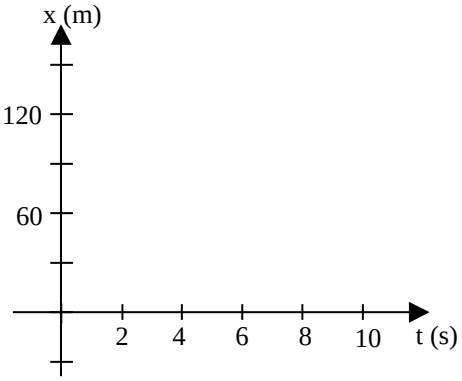
Discussion Problems: Set 01

P1. A driver is riding along at the steady speed of *25 m/s* (90 km/h) when she notices an obstruction in the road ahead. After a reaction time of *2 s*, she applies the brakes to decelerate at the rate of *2.5 m/s*^{2}.

i. *Sketch* a graph of the acceleration, velocity and position of the car starting at time t=0 when she first noticed the obstruction.

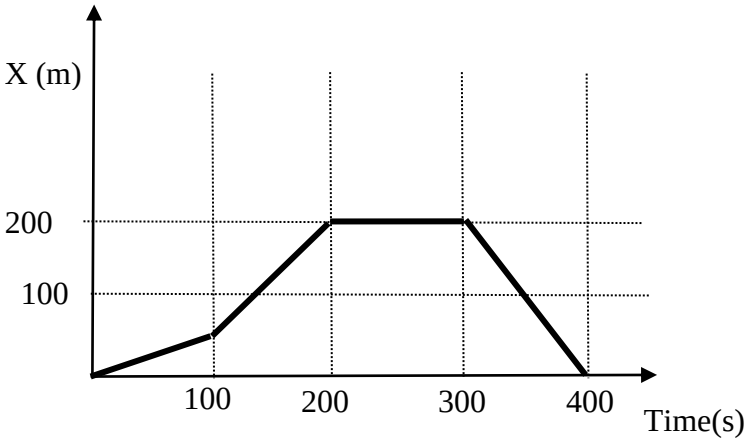






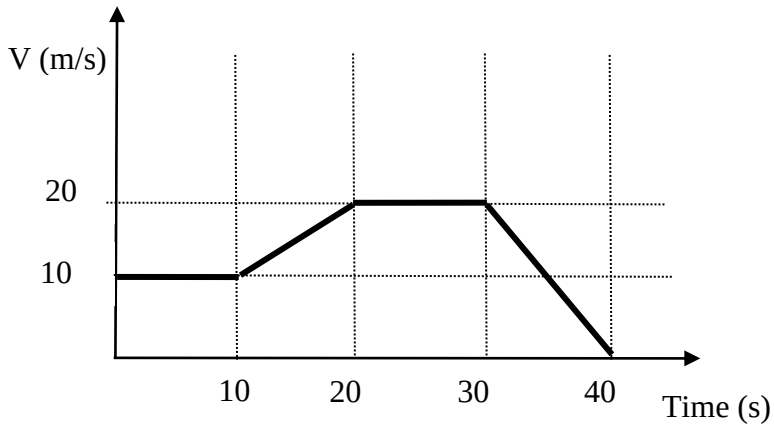
P2. Peter goes for a walk along the *x*-axis. The walk takes

him *400 seconds* to complete. The graph below shows his position *X* as a function of time.



i. What was the average velocity of the walk?
ii. What was the maximum speed reached during the walk?
iii. What is the instantaneous velocity at 350 s?
iv. What is the average velocity between100 s-200 s?
v. Which segment the Peter is walking to right/left?

P3. The following velocity vs. time graph represents the motion of a car:



i. What was the acceleration of the car at $t = 35\ s$?
ii. What is the average acceleration between $10\ s - 20\ s$?
iii. What was the displacement of the car between $t = 0\ s$ and $t = 40\ s$?
iv. What is the average acceleration for the entire motion?
v. Which segment the car is moving to right/left?
vi. Which segment the car is slowing down?