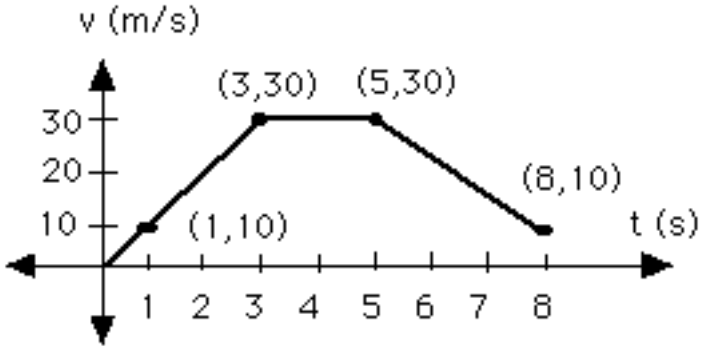
Kinematics - (incl. acceleration) - Quiz 2.0H

Assume motion along a straight line.

1. The rate of change of velocity with respect to time is:
   (a) change in velocity (b) uniform acceleration (c) instantaneous speed
   (d) acceleration (e) given by the Merton Rule
2. The slope of a tangent line to a velocity-time graph is:
   (a) average speed (b) average velocity (c) instantaneous acceleration
   (d) average acceleration (e) c and d
3. Uniform acceleration means:
   (a) velocity does not change (b) speed does not change (c) acceleration is proportional to time (d) the velocity-time curve is a line (e) free fall

Use the velocity-time graph shown here.



4. What is the initial velocity?
5. Find average acceleration from t=0 to t=5 s.
6. Find the instantaneous acceleration when t=6 s.
7. When is acceleration zero?
8. When is the particle moving to the left?
9. What is average acceleration from t=1 to t=8 s ?
10. When is velocity zero?
11. What is the average velocity over the first 3 seconds?
12. What is the distance traveled from t=0 to t=5 s ?
13. What is the average acceleration from t=5 to t=8 s ?

Use the position function given below. (Assume MKS units.)

$x(t) = t^2 - 4t + 3$

14. What is the initial position of the particle?
15. When is the particle at the origin?
16. Which way is the particle moving when t=0 s ?

17. v(t) = ?
18. Where is the particle when velocity (instantaneous) is zero?
19. When does the particle change directions?
20. What, if anything, is the acceleration?