Kinematics (incl. instantaneous velocity) - Quiz 1.4H

Assume motion along a straight line.

1. Displacement from x_1 to x_2 is:
   (a) change in velocity (b) $x_i - x_f$ (c) $|x_1 - x_2|$ (d) distance traveled (e) none of the above
2. $|x_f - x_i|$ represents:
   (a) distance traveled (b) change in position (c) displacement (d) b and c (e) none of the above
3. What is instantaneous speed?

Use the position-time graph shown here.

4. What is the initial position?
5. When is the particle at rest?
6. Where is the particle when it changes directions?
7. What is the average velocity from t=3 to t=4 s ?
8. What is the instantaneous velocity when t=4.5 s ?
9. What is the average speed from t=2 to t=3 s ?
10. What is the average velocity over the first five seconds?
11. What is the average speed from t=1 to t=5 s ?
12. When is the particle moving left?
13. When is the particle to the left of the origin?
14. What is the distance traveled by the particle in the first five seconds?

Use the position function given below.

$x(t) = t^3 + 4t^2 + 7t - 3$ (Assume MKS units where none are given.)

15. Derive the velocity function, v(t) = ?
16. What is the instantaneous velocity when t = 2 s ?
17. What is the average velocity from t=1 to t=3 s ?