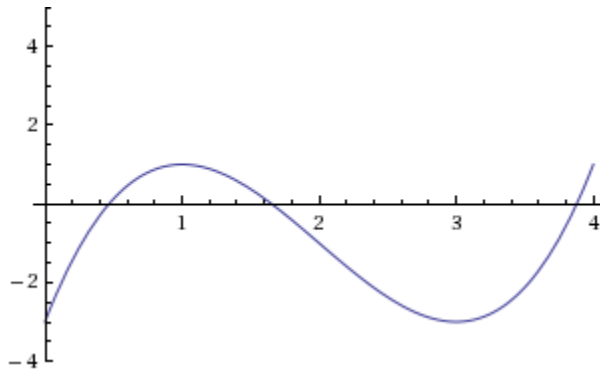A. particle is moving up and down along a vertical straight line. The graph of its position $s = f(t)$ is pictured below, where s is measured in meters and t in seconds.

Answer a)-c) based solely on information in the picture.

a) When does the particle have positive velocity? negative velocity?

b) When does the particle have positive acceleration? negative acceleration?

c) What is the <u>average velocity</u> of the point during the trip? Are there any times where the instantaneous velocity appears to equal the average velocity?

Suppose now that you know the actual equation: $s = f(t) = t^3 - 6t^2 + 9t - 3$.

d) Give an exact answer for part b).

e) During the trip (that is, for $0 \le t \le 4$) :

      i) What is the net <u>change of position</u> of the particle?

      ii) What is the <u>total distance traveled</u> by the particle?

t	s
0	-3
1	1
2	-1
3	-3
4	1