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Particle Motion Practice

1. A particle moves along the x-axis so that at any time $t \geq 0$ its position is given by $x(t) = t^3 - 12t + 5$.

a) What is the particle's initial position?

b) What is the average velocity over the time interval $[1,4]$? Show the computations that lead to your answer.

c) At time $t = 4$, is the speed of the particle increasing or decreasing? Explain your answr.

2.

t (sec)	0	3	5	8	12	14	17	20	25
$v(t)$ (ft/sec)	15	9	6	4	2	-3	-5	-8	-14

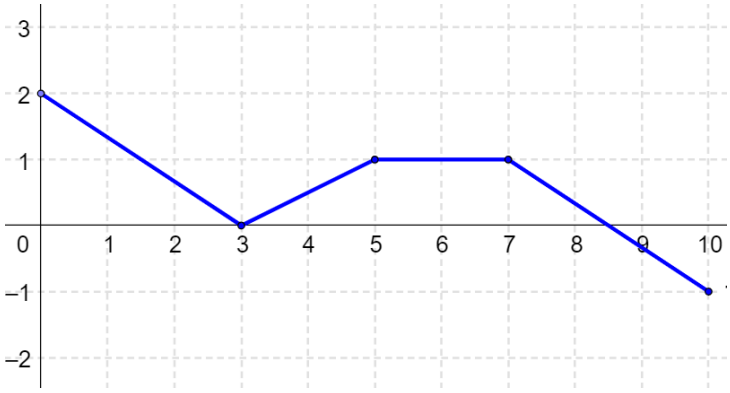
The table above provides the velocities of a rocket recorded at specific times. Using the table, answer the following questions:

a) Is there ever an interval in which velocity of the rocket is zero? Explain your answer.

b) During which time interval is the rocket's position decreasing? Explain your answer.

c) Find an approximation for the acceleration of the rocket at $t = 6$. Show the computations that lead to your answer.

3. A particle moves along the x-axis with velocity as shown in the graph below.



a) At $t = 0$, is the particle moving to the left or right? Justify your answer.

b) When is the particle at rest? Justify your answer.

c) When is the acceleration of the particle zero? Justify your answer.

d) When does the particle change direction? Justify your answer.