

AP Calculus AB Set 5

No calculator

#1

A particle moves on the x -axis so that its velocity at any time t is given by $v(t) = \sin 2t$. At $t = 0$, the particle is at the origin.

- For $0 \leq t \leq \pi$, find all values of t for which the particle is moving to the left.
- Write an expression for the position of the particle at any time t .
- For $0 \leq t < \frac{\pi}{2}$, find the average value of the position function determined in part (b).

#2

A particle moves along the x -axis in such a way that its acceleration at time t for $t > 0$ is given by $a(t) = \frac{3}{t^2}$. When $t = 1$, the position of the particle is 6 and the velocity is 2.

- Write an equation for the velocity, $v(t)$, of the particle for all $t > 0$.
- Write an equation for the position, $x(t)$, of the particle for all $t > 0$.
- Find the position of the particle when $t = e$.

#3

A particle moves along the x -axis so that at time t its position is given by $x(t) = t^3 - 6t^2 + 9t + 11$.

- What is the velocity of the particle at $t = 0$?
- During what time intervals is the particle moving to the left?
- What is the total distance traveled by the particle from $t = 0$ to $t = 2$?