

Motion Problems

A point moves in a straight line so that its distance at time t from a fixed point of the line is $8t - 3t^2$. What is the *total* distance covered by the point between $t = 1$ and $t = 2$?

- (A) 1 (B) $\frac{4}{3}$ (C) $\frac{5}{3}$ (D) 2 (E) 5

The position of a particle moving along a straight line at any time t is given by $s(t) = t^2 + 4t + 4$. What is the acceleration of the particle when $t = 4$?

- (A) 0 (B) 2 (C) 4 (D) 8 (E) 12

If the position of a particle on the x -axis at time t is $-5t^2$, then the average velocity of the particle for $0 \leq t \leq 3$ is

- (A) -45 (B) -30 (C) -15 (D) -10 (E) -5

A particle moves along the x -axis so that at any time $t \geq 0$ its position is given by $x(t) = t^3 - 3t^2 - 9t + 1$. For what values of t is the particle at rest?

- (A) No values (B) 1 only (C) 3 only (D) 5 only (E) 1 and 3

A particle moves along a line so that at time t , where $0 \leq t \leq \pi$, its position is given by $s(t) = -4 \cos t - \frac{t^2}{2} + 10$. What is the velocity of the particle when its acceleration is zero?

- (A) -5.19 (B) 0.74 (C) 1.32 (D) 2.55 (E) 8.13

A particle moves along the x -axis so that its position at time t is given by $x(t) = t^2 - 6t + 5$. For what value of t is the velocity of the particle zero?

- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5