

CALCULUS I - Worksheet #49

1. If a particle's motion along a straight line is given by $s = t^3 - 6t^2 + 9t + 2$, then s is increasing
 - A) when $1 < t < 3$
 - B) when $-1 < t < 3$
 - C) for all t
 - D) when $|t| > 3$
 - E) when $t < 1$ or $t > 3$

2. The acceleration of a particle moving along a straight line is given by $a = 6t$. If, when $t = 0$, its velocity, v , is 1 and its distance, s , is 3, then at any time t
 - A) $s = t^3 + 3$
 - B) $s = t^3 + 3t + 1$
 - C) $s = t^3 + t + 3$
 - D) $s = \frac{t^3}{3} + t + 3$
 - E) $s = \frac{t^3}{3} + \frac{t^2}{2} + 3$

3. The position of a point P on a line at time t is given by $s = t^3 + t^2 - t - 3$. P is moving to the right for
 - A) $t > -1$
 - B) $t < -\frac{1}{3}$ or $t > 1$
 - C) $t < -1$ or $t > \frac{1}{3}$
 - D) $-1 < t < \frac{1}{3}$
 - E) $t < \frac{1}{3}$

4. If the displacement from the origin of a particle on a line is given by $s = 3 + (t - 2)^4$, then the number of times the particle reverses direction is
 - A) 0
 - B) 1
 - C) 2
 - D) 3
 - E) none of these

5. A particle moves along a line with velocity, in feet per second, $v = t^2 - t$. The total distance, in feet, traveled from $t = 0$ to $t = 2$ equals
 - A) $\frac{1}{3}$
 - B) $\frac{2}{3}$
 - C) 2
 - D) 1
 - E) $\frac{4}{3}$

6. If the position of a particle on a line at time t is given by $s = t^3 + 3t$, then the velocity of the particle is decreasing when
 - A) $-1 < t < 1$
 - B) $-1 < t < 0$
 - C) $t < 0$
 - D) $t > 0$
 - E) $|t| > 1$

7. A particle moves along a line so that its acceleration, a , at time t is $a = -t^2$. If the particle is at the origin when $t = 0$ and 3 units to the right of the origin when $t = 1$, then its velocity at $t = 0$ is
 - A) 0
 - B) $\frac{1}{12}$
 - C) $2\frac{11}{12}$
 - D) $\frac{37}{12}$
 - E) none of these