

MCS22 Homework 14

1. A particle is moving along a horizontal line with position function $s(t) = t^3 - 12t^2 + 36t - 24$ for $t \geq 0$.
 - (a) When is the particle moving to the left? to the right?
 - (b) When does the particle change its direction?
 - (c) When is the particle speeding up? slowing down?
 - (d) What is the total distance travelled by the particle from $t = 1$ to $t = 7$?

2. A particle is moving along a horizontal line with position function $s(t) = -t^3 + 9t^2 - 24t + 1$ for $t \geq 0$.
 - (a) When is the particle moving to the left? to the right?
 - (b) When does the particle change its direction?
 - (c) When is the particle speeding up? slowing down?
 - (d) What is the total distance travelled by the particle from $t = 0$ to $t = 5$?

3. A particle is moving along a horizontal line with position function $s(t) = 2 + 6t - t^2$ for $t \geq 0$.
 - (a) When is the particle at rest?
 - (b) When is the speed of the particle constant?
 - (c) What is the total distance travelled by the particle from $t = 0$ to $t = 5$?

4. If the position function of a particle is $x(t) = t + \frac{9}{t+1} + 1$, find the total distance and the total displacement from $t = 0$ to $t = 8$.