Q1]...[5 points] A man walks along a straight path at a speed of 1.5\text{m/s}. A searchlight is located on the ground 6m from the path and is kept focused on the man. At what rate is the searchlight rotating when the man is 8m from the point on the path closest to the searchlight?
The position of a particle is given by \( s(t) = t^3 - 6t^2 + 9t \), where \( t \) is measured in seconds and \( s \) in meters.

1. When is the particle moving forward?

2. Find the total distance traveled by the particle during the first five seconds.

3. When is the particle speeding up?