

1. (10pts) A displacement (in centimeter) of a particle moving along a curve is defined as:  $s(t) = 2t^2 - 3t$  where  $t$  is measured in seconds.

(1) Find the displacement when  $t = 1$ .

(2) Express the average velocity during the time period:  $[1, b]$  in terms of  $b$ .

(3) Express the average velocity during the time period:  $[1, 1 + h]$  in terms of  $h$ .

(4) (Calculator) Find the average velocity during each time period:

(i)  $[1, 2]$     (ii)  $[1, 1.1]$     (iii)  $[1, 1.01]$     (iv)  $[1, 1.001]$     (v)  $[1, 1.0001]$

(5) Estimate the velocity of the particle at  $t = 1$ .