ENGR-2060

E.M. - DYNAMICS

NAME

DATE

SOLUTIONS

PROBLEM: AP-3

GIVEN:

The position of a particle along a straight line is given by $s = (1.5t^3 - 13.5t^2 + 22.5t)$ ft, where t is in seconds. Determine the position of the particle when $t = 6$ s and the total distance it travels during the 6-s time interval. *Hint:* Plot the path to determine the total distance traveled.

REQUIRED:

$S_{t=6} = ?$

$S_{TOTAL} = ?$

SOLUTION:

$$S = 1.5t^3 - 13.5t^2 + 22.5t$$

$$S(t=6) = -27.0 \text{ FT}$$

$$v = \frac{ds}{dt} = 4.5t^2 - 27t + 22.5$$

$$v = 0 = \text{"}$$

$t = 1, 5$ WHEN $v = 0$

0-1, 1-5, 5-6

$S_0 = 0$

$S_1 = 10.5$ } 10.5

$S_5 = -37.5$ } 48

$S_6 = -27.0$ } 10.5

69.0 FT

$$\boxed{\begin{array}{l} S_{t=6} = -27.0 \text{ FT} \\ S_{TOTAL} = 69.0 \text{ FT} \end{array}}$$