Name: [1 pt]

Problem 1. Find the derivative of the polynomial $f(x) = x^{100} - x^{10} + x + 1000$.   [5 pts]

$$f'(x) = 100\,x^{99} - 10\,x^{9} + 1$$

Problem 2. A particle moves along x-axis with its displacement varying with time as $s(t) = t^3 - 3t$. Find the time interval when the particle is moving to the <u>left</u>.   [5 pts]

$$v(t) = \frac{ds}{dt} = 3t^2 - 3$$

$$v(t) < 0 \implies 3t^2 - 3 < 0$$

$$\implies 3(t^2 - 1) < 0$$

$$\implies t^2 - 1 < 0$$

$$\implies t \text{ lies in } (-1, 1).$$

$$t^2 - 1 = 0 \implies t^2 = 1 \implies t = \pm 1$$

Since time cannot be $-ve$ we reject $(-1, 0)$ Part.

$\implies$ The Particle was moving to the left in the time interval $(0, 1)$