Name: [1 pt]

Problem 1. Let $f(x)$ be given by $f(x) = \begin{cases} \sin x & \text{if } x < 0, \\ 0 & \text{if } x = 0, \\ x^2 - 2x + 1 & \text{if } x > 0. \end{cases}$

Find the numbers (values of x) at which f is discontinuous. Is f continuous on the intervals $[0, 1]$ and $[-1, 0]$? Explain why or why not. [1+2+2 pts]

Problem 2. Find the acceleration at the time instant $t = 0$ of a particle moving in straight line with velocity $v(t) = t - t^2$, using the limit definition of derivative. [5 pts]