

Name:

ID:

Instructions: Show your work clearly. Good luck.

Problem 1. (6 points) Sketch the graph of a function f that satisfies the following conditions:

a) $f(0) = 0$

b) For $x \in (0, 1)$, $f'(x) = 1$

c) $\lim_{x \rightarrow 4^+} f(x) = -1$

d) $\lim_{x \rightarrow 4^-} f(x) = -\infty$

e) $\lim_{x \rightarrow \infty} f(x) = 3$

f) $\lim_{x \rightarrow -\infty} f(x) = \infty$

Problem 2. (4 points) The position function of a particle moving along a straight line is given as $s(t) = t^{-1} + 1$, where t is in seconds. Find:

a) The average velocity of the particle between $t = 1$ and $t = 2$.b) The instantaneous velocity of the particle at $t = 1$.