

Math 1A Quiz 5
November 16th, 2007

Name _____ SID _____

1. A particle is moving with acceleration $a(t) = e^{-t}$ meters per second squared. Its position at time $t = 0$ is $s(0) = 0$ and its average velocity between times $t = 0$ and $t = 1$ is $-1 - 1/e$ meters per second. Find the velocity of the particle at time $t = 0$.

2. You are going to make a box with a square base and no top. If the surface area of the resulting box is going to be 100 square inches, what is the largest volume of box you can make? [Note: the answer isn't pretty.]

3. Show that for all real numbers a and b ,

$$|\cos a - \cos b| \leq |a - b|$$

Bonus Point: Find two functions f and g , defined for all real numbers, such that f and g are both increasing, but fg is decreasing.