Motion Notes for AP Calculus **Name:**

Given a position function, its derivative is a _____function .

Given velocity function, its derivative is a _____ function.

AVERAGE VELOCITY in the interval (a,b) , given p(x) is a position function, is…

AVERAGE ACCELERATION in the interval (a,b) , given v(x) is the velocity function, is…

A particle is moving to the right (or up) when _____ is positive

A particle is moving to the left (or down) when its _____ is negative

A particle is at rest (or is stopped) when its _____ is zero

A particle is speeding up if its _____ and _____ have the same sign (at that point)

A paricle's VELOCITY is increasing when _____.

A particle is moving towards the origin when its _____ and _____ have opposite signs

Displacement is the _____ in positions between two times. Can displacement be negative?_____

Total distance traveled by a particle is the sum of the amounts it displaces between the start and all stop(s) and the end. Can distance be negative? _____

Motion practice **Name:**
AP Calculus

Given the following position function for an object traveling in a straight line, supply reasoning for your answer(s), either in words or well organized mathematics or both, for each problem below. You may use a calculator. Let's assume t = hours and x(t) = miles.

$x(t) = e^{-2t} + sin^2(3-t) - \frac{1}{2}$ over the time interval [0,2].

1) When does the object stop?

2) What is the object's displacement from [0,2]

3) Is the object speeding up or slowing down at t = $\frac{1}{2}$?

4) Determine the object's total distance traveled from [0,2]