1) Find the value of c implied by mean value theorem for the following function

$$f(x) = x^3 - x^2 - 2x \tag{1}$$

on the interval $[0, 1]$. Find the point at which the average velocity is equal to instantaneous velocity.
Hint: First, find the average velocity in this interval and then find the derivative of this function. Remember! They are supposed to be equal at that promising point! If you are in right track then the point you find in second section must be equal to c.

2) Suppose that f is a differentiable function and for every x, $f^{'}(x) < 2$. If $f(2) = -3$, then find the largest value for $f(5)$.
Hint:Use mean value theorem for the interval $[2, 5]$. For those of you who don't know mean value theorem, no body gives you any hint on your exam. Please learn it and keep it in your mind for ever!
Mean value theorem: If f is a differentiable function on (a,b), then there exist a point $c \in (a, b)$ such that

$$f^{'}(c) = \frac{f(b) - f(a)}{b - a} \tag{2}$$

In this problem, the key point is that $f^{'}(x)$ is less than 2 for every x.