Problem-Set 07

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Problem. 1

Problem. 2

"continuity" prob. 14, p. 100

Problem. 3

By hypothesis, For any reals x and t, We are given $|f(t) - f(x)| \leq (t-x)^2$. Clearly:

$$\begin{aligned} \frac{|f(t)-f(x)|}{|t-x|} \leq & \frac{(t-x)^2}{|t-x|} \\ \left|\frac{f(t)-f(x)}{t-x}\right| \leq & |t-x| \end{aligned}$$

But $\lim_{t\to x} |t-x| = 0$ which concludes $\lim_{t\to x} \left|\frac{f(t)-f(x)}{t-x}\right| \leq 0$. Since the absolute value is always equal or greater than 0, We get also $\lim_{t\to x} \left|\frac{f(t)-f(x)}{t-x}\right| \geq 0$. Therefore $f'(x) = 0$ for any real x. ■