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4.8

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oula-khouzam

Post subject: 4.8

Posted: Mon, 04 May 2020 15:00

offline

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Since f is a function that continuous at $x_0 \in D$ so we can write:

For all $\epsilon_1 > 0$ there is $\delta_1 > 0$ such that for all $x \in D$ we have that

$$|x - x_0| < \delta_1, |f(x) - f(x_0)| < \epsilon_1$$

also since g is a function that continuous at $f(x_0) \in E$ so we can write:

For all $\epsilon_2 > 0$ there is a $\delta_2 > 0$ such that for all $y \in E$ we have that

$$|y - f(x_0)| < \delta_2, |g(y) - g(f(x_0))| < \epsilon_2$$

since $f(D) \subseteq E$, so $f(x_0)$ and $f(x)$ are $\in E$

$$|f(x) - f(x_0)| < \delta_2, |g(f(x)) - g(f(x_0))| < \epsilon_2$$

let $\delta_2 = \epsilon_1$

so we can write:

$$|x - x_0| < \delta_1, |f(x) - f(x_0)| < \epsilon_1, |g(f(x)) - g(f(x_0))| < \epsilon_2$$

$$\Rightarrow |x - x_0| < \delta_1 \Rightarrow |f(x) - f(x_0)| < \epsilon_1 \Rightarrow |g \circ f(x) - g \circ f(x_0)| < \epsilon_2$$

so $g \circ f(x)$ is continuous at x_0

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helmut

Post subject: Re: 4.8

Posted: Thu, 07 May 2020 13:36

online

Site Admin

A little convoluted, but essentially correct. 1 credit for Oula!

The greater danger for most of us lies not in setting our aim too high and falling short; but in setting our aim too low, and achieving our mark. - Michelangelo Buonarroti



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