Problem 7. Let $f \in C^1 (\mathbb{R}, \mathbb{R})$ with properties :

(i) $f(x+y) = f(x) f(y)$

(ii) $f(x-y) f(y) = f(x)$.

Then show that the function indeed is given by:

$f(x) = ce^{\alpha x}$ where both c, α are some real constants with $c-$non-zero and

$\alpha = \lim\limits_{h \to 0} \left(\frac{f(h)-1}{h} \right)$