Quiz 2 (Dr. AL-Homidan)(161)

Name:- ID:-

Find the limit if exist for $\lim_{x\to 2}\frac{\sqrt{4x+1}-3}{x-2}$.

$$\lim_{x\to 2}\frac{\sqrt{4x+1}-3}{x-2}\cdot\left(\frac{\sqrt{4x+1}+3}{\sqrt{4x+1}+3}\right) \quad (2)$$

$$=\lim_{x\to 2}\frac{4x+1-9}{(x-2)\left(\sqrt{4x+1}+3\right)}=\lim_{x\to 2}\frac{4(x-2)}{(x-2)\left(\sqrt{4x+1}+3\right)} \quad (3)$$

$$=\lim_{x\to 2}\frac{4}{\left(\sqrt{4x+1}+3\right)}=\frac{4}{6}=\frac{2}{3}$$

Prove by definition $\lim_{x\to 4}2x-5=3$

Let $\varepsilon>0$, we need to find $\delta>0$ such that

$|x-4|<\delta$ then $|2x-5-3|<\varepsilon$ (2)

$$|2x-5-3|<\varepsilon \Leftrightarrow 2|x-4|<\varepsilon \Leftrightarrow |x-4|<\varepsilon/2 \quad (3)$$

we choose $\delta=\varepsilon/2$.