$$\text{۳)}\ \lim_{x\to ۴}\frac{x\sqrt{x}-۸}{x-۴\sqrt{x}+۴}=\lim_{x\to ۴}\frac{(x^{۳}-۶۴)}{(\sqrt{x}-۲)^{۲}.(x\sqrt{x}+۸)}$$

$$=\lim_{x\to ۴}\frac{(x-۴)(x^{۲}+۱۶+۴x)}{(\sqrt{x}-۲)^{۲}(x\sqrt{x}+۸)}=\ \text{وجود ندارد}$$

۴) $\lim_{x\to\frac{\pi}{۲}} \frac{\text{Cos}^{۲}x}{\text{Sin}\,x+\text{Sin}\,۳x}$

$$= \lim_{x\to\frac{\pi}{۲}} \frac{\text{Cos}^{۲}x}{۲\,\text{Sin}\,۲x\,\text{Cos}\,x} = \lim_{x\to\frac{\pi}{۲}} \frac{\text{Cos}^{۲}x}{۴\,\text{Sin}\,x\,\text{Cos}^{۲}x} = \frac{۱}{۴}$$

۵) $\lim_{x\to۰} \frac{۱-\text{Cos}۴x}{\text{Sin}^{۲}x} = \lim_{x\to۰} \frac{۲\,\text{Sin}^{۲}۲x}{\text{Sin}^{۲}x} = \lim_{x\to۰} \frac{۸\,\text{Sin}^{۲}x\,\text{Cos}^{۲}x}{\text{Sin}^{۲}x} = ۸$