

5.28 1)

$$-1 \leq \eta\mu \frac{1}{x} \leq 1 \stackrel{x^2 \geq 0}{\Rightarrow} -x^2 \leq x^2 \eta\mu \frac{1}{x} \leq x^2 \quad (1)$$

$$\text{Όμως } \lim_{x \rightarrow 0} (-x^2) = \lim_{x \rightarrow 0} (x^2) = 0 \quad (2)$$

$$\text{Οπότε } (1), (2) \stackrel{\text{κριτήριο παρεμβολής}}{\Rightarrow} \boxed{\lim_{x \rightarrow 0} x^2 \eta\mu \frac{1}{x} = 0}$$

5.28 2)

$$-1 \leq \sigma\upsilon\nu \frac{3}{x} \leq 1 \stackrel{4x^2 \geq 0}{\Rightarrow} -4x^2 \leq 4x^2 \sigma\upsilon\nu \frac{3}{x} \leq 4x^2 \quad (1)$$

$$\text{Όμως } \lim_{x \rightarrow 0} (-4x^2) = \lim_{x \rightarrow 0} (4x^2) = 0 \quad (2)$$

$$\text{Οπότε } (1), (2) \stackrel{\text{κριτήριο παρεμβολής}}{\Rightarrow} \boxed{\lim_{x \rightarrow 0} 4x^2 \sigma\upsilon\nu \frac{3}{x} = 0}$$

5.28 3)

$$-1 \leq \eta\mu \frac{x}{x+2} \leq 1 \stackrel{\sqrt{x^2+x-2} \geq 0}{\Rightarrow} -\sqrt{x^2+x-2} \leq \sqrt{x^2+x-2} \eta\mu \frac{x}{x+2} \leq \sqrt{x^2+x-2} \quad (1)$$

$$\text{Όμως προφανώς } \lim_{x \rightarrow -2} (-\sqrt{x^2+x-2}) = \lim_{x \rightarrow -2} (\sqrt{x^2+x-2}) = 0 \quad (2)$$

$$\text{Οπότε } (1), (2) \stackrel{\text{κριτήριο παρεμβολής}}{\Rightarrow} \boxed{\lim_{x \rightarrow -2} \sqrt{x^2+x-2} \eta\mu \frac{x}{x+2} = 0}$$

5.28 4)

$$-1 \leq \eta\mu \frac{4x-1}{2x+8} \leq 1 \stackrel{|x^3+64| \geq 0}{\Rightarrow} -|x^3+64| \leq |x^3+64| \eta\mu \frac{4x-1}{2x+8} \leq |x^3+64| \quad (1)$$

$$\text{Όμως προφανώς } \lim_{x \rightarrow -4} (-|x^3+64|) = \lim_{x \rightarrow -4} (|x^3+64|) = 0 \quad (2)$$

$$\text{Οπότε } (1), (2) \stackrel{\text{κριτήριο παρεμβολής}}{\Rightarrow} \boxed{\lim_{x \rightarrow -4} |x^3+64| \eta\mu \frac{4x-1}{2x+8} = 0}$$

5.28 5)

$$-1 \leq \eta\mu \frac{2x}{x^2+x-2} \leq 1 \stackrel{(x-1)^2 \geq 0}{\Rightarrow} -(x-1)^2 \leq (x-1)^2 \eta\mu \frac{2x}{x^2+x-2} \leq (x-1)^2 \quad (1)$$

$$\text{Όμως προφανώς } \lim_{x \rightarrow 1} (-(x-1)^2) = \lim_{x \rightarrow 1} ((x-1)^2) = 0 \quad (2)$$

$$\text{Οπότε } (1), (2) \stackrel{\text{κριτήριο παρεμβολής}}{\Rightarrow} \boxed{\lim_{x \rightarrow 1} (x-1)^2 \eta\mu \frac{2x}{x^2+x-2} = 0}$$