

Date: / /  
(تاریخ)

(تالیف)

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الف)  $\lim_{n \rightarrow \mu^+} \epsilon_{n-\mu} \Rightarrow$

ب)  $\lim_{n \rightarrow \mu^-} \epsilon_{n-\mu}$  (1)

$\lim_{n \rightarrow \mu^+} f(n) - \mu = \Lambda^+ - \mu = \delta^+ = \delta$

$\lim_{n \rightarrow \mu^-} f(n) - \mu = \Lambda^- - \mu = \delta^- = \delta$

الف)  $\lim_{n \rightarrow \mu^+} \epsilon [n] - \mu$

ب)  $\lim_{n \rightarrow \mu^-} \epsilon [n] - \mu$  (2)

$\lim_{n \rightarrow \mu^+} \epsilon [n, \dots, 1] - \mu = \epsilon(\mu) - \mu = \delta$

$\lim_{n \rightarrow \mu^-} \epsilon [1, 999999] - \mu = \epsilon - \mu = \delta$

الف)  $\lim_{n \rightarrow \mu^+} \epsilon_{n-\mu}$

ب)  $\lim_{n \rightarrow \mu^-} \epsilon_{n-\mu}$  (3)

$\lim_{n \rightarrow \mu^+} \epsilon(\mu^+) - \mu = [\Lambda^+ - \mu] = \delta$

$\lim_{n \rightarrow \mu^-} \epsilon(\mu^-) - \mu = [\Lambda^- - \mu] = \delta$

الف)  $\lim_{n \rightarrow \mu^+} \epsilon_{n-\mu}$

ب)  $\lim_{n \rightarrow \mu^-} \epsilon_{n-\mu}$  (4)

$\lim_{n \rightarrow \mu^+} \epsilon_{n-\mu} \rightarrow \epsilon(\mu^+) - \mu = \delta$

$\lim_{n \rightarrow \mu^-} \epsilon_{n-\mu} = \epsilon(\mu^-) - \mu = \delta$

الف)  $\lim_{n \rightarrow \mu} \frac{\epsilon_{n-\mu}}{n-\mu} = \frac{q}{0^+}$  (اليمين)

ب)  $\lim_{n \rightarrow \mu} \frac{\epsilon_{n-\mu}}{(n-\mu)^r} = \frac{q}{(0^+)^r}$  (اليمين) (5)

$\lim_{n \rightarrow \mu^+} \frac{\epsilon_{n-\mu}}{n-\mu} = \frac{q}{0^+} = +\infty$

$\lim_{n \rightarrow \mu^+} \frac{\epsilon_{n-\mu}}{(n-\mu)^r} = \frac{q}{(0^+)^r} = +\infty$

$\lim_{n \rightarrow \mu^-} \frac{\epsilon_{n-\mu}}{n-\mu} = \frac{q}{0^-} = -\infty$

$\lim_{n \rightarrow \mu^-} \frac{\epsilon_{n-\mu}}{(n-\mu)^r} = \frac{q}{(0^-)^r} = +\infty$

الف)  $\lim_{n \rightarrow \mu} \frac{\epsilon_{n-\mu}}{\sqrt{n-\mu}} = \frac{9}{\sqrt{0^+}}$

$\lim_{n \rightarrow \mu^+} \frac{\epsilon_{n-\mu}}{\sqrt{n-\mu}} = \frac{9}{\sqrt{0^+}} = +\infty$

$\lim_{n \rightarrow \mu^-} \frac{\epsilon_{n-\mu}}{\sqrt{n-\mu}} = \frac{9}{\sqrt{0^-}} = 0^-$

ب)  $\lim_{n \rightarrow \mu} \frac{\epsilon_{n-\mu}}{\sqrt{n^2 - \epsilon_{n+\mu}}} = \frac{\epsilon_{n-\mu}}{\sqrt{(n-\mu)(n+1)}}$

$\Rightarrow \frac{9}{\sqrt{0^+}} \frac{1}{+ | - | +} = \frac{9}{0^+} = +\infty$

$\lim_{n \rightarrow \mu^+} \frac{\epsilon_{n-\mu}}{\sqrt{n^2 - \epsilon_{n+\mu}}} = \frac{9}{\sqrt{0^+}} = +\infty$

$\lim_{n \rightarrow \mu^-} \frac{\epsilon_{n-\mu}}{\sqrt{n^2 - \epsilon_{n+\mu}}} = \frac{9}{\sqrt{0^-}} = 0^-$

الف)  $\lim_{n \rightarrow \mu} \frac{\epsilon_{n-\mu}}{n^2 - \sqrt{n+1}} \Rightarrow \frac{\epsilon_{n-\mu}}{(n-\mu)(n+1)} = \frac{9}{0^-}$  (موجب) (V)

$\frac{+ | - | +}{0^-} \lim_{n \rightarrow \mu^+} \frac{\epsilon_{n-\mu}}{n^2 - \sqrt{n+1}} = \frac{9}{0^-} = -\infty$

$\lim_{n \rightarrow \mu^-} \frac{\epsilon_{n-\mu}}{n^2 - \sqrt{n+1}} = \frac{9}{0^+} = +\infty$

ب)  $\lim_{n \rightarrow \mu} \frac{\epsilon_{n-\mu}}{[n-\mu]}$

$\lim_{n \rightarrow \mu^+} \frac{\epsilon_{n-\mu}}{[n-\mu]} \Rightarrow \frac{9}{\sqrt{0^+}} = 0^-$  (موجب)

$\lim_{n \rightarrow \mu^-} \frac{\epsilon_{n-\mu}}{[n-\mu]} \Rightarrow \frac{9}{-1} = -9$

الف)  $\lim_{n \rightarrow \mu} [r_n] + [-r_n]$  (A)

موجب

$\lim_{n \rightarrow \mu^+} [r_n] + [-r_n] \Rightarrow n > \mu \rightarrow r_n > 9$   
 $\rightarrow r_n > 4 \rightarrow -r_n < -4$   
 $\Rightarrow [9, \dots] + [-4, \dots] = 9 - 4 = 5$

$\lim_{n \rightarrow \mu^-} [r_n] + [-r_n] \Rightarrow n < \mu \rightarrow r_n < 9$   
 $\rightarrow -r_n > -9$   
 $\Rightarrow [1, \dots] + [-9, \dots] = 1 - 9 = -8$

ب)  $\lim_{n \rightarrow -4} [-\epsilon_n] + [r_n]$

⊙

$\lim_{n \rightarrow -4} [-\epsilon_n] + [r_n] \Rightarrow n > -4 \rightarrow \begin{cases} r_n > -r \\ -\epsilon_n < r\epsilon \end{cases}$

$[r^3, \dots] + [-11, \dots]$   
 $r^3 - 11 \leq 11$

$\lim_{n \rightarrow -4} [-\epsilon_n] + [r_n] \Rightarrow n < -4 \rightarrow \begin{cases} r_n < -1r \\ -\epsilon_n > r\epsilon \end{cases}$   
 $r \leq -1r \leq 11$

ج)  $\lim_{n \rightarrow r} [n^r - \epsilon_n]$   $\rightarrow$   $\lim_{n \rightarrow r^+} [n^r - \epsilon_n]$   
 $\lim_{n \rightarrow r^-} [n^r + \epsilon_n]$

⊙

$\lim_{n \rightarrow r^+} [n^r - \epsilon_n] \Rightarrow [n(n - \epsilon)] = [r, 1(r, 1 - \epsilon)]$   
 $[-\epsilon, \epsilon] \leq -\epsilon$

⊙

$\lim_{n \rightarrow r^-} [n^r + \epsilon_n] \Rightarrow [n(n + \epsilon)] = [1, 1(1, 1 + \epsilon)]$   
 $[-\epsilon, \epsilon] \leq -r$

ب)  $\lim_{n \rightarrow 4} [4n - n^2]$   $\rightarrow$   $\lim_{n \rightarrow 4^+} [4n - n^2] = [n(4 - n)] = [4, 1(4 - \epsilon, 12)]$   
 $= [1, 99] \leq 1$

ب)  $\lim_{n \rightarrow 4^-}$

$\lim_{n \rightarrow 4^-} [4n - n^2] = [n(4 - n)] = [4, 1(4 - \epsilon, 9)]$   
 $= [1, 99] \leq 1$

$$\text{الف) } \lim_{n \rightarrow p} \frac{|n-p|}{n^2 - p^2} \rightarrow \lim_{n \rightarrow p^+} \frac{|n-p|}{(n-p)(n+p)} \quad \boxed{\text{الحد}} \quad (10)$$

$$\lim_{n \rightarrow p^+} \frac{(n-p)}{(n-p)(n+p)} = \frac{1}{n+p} = \frac{1}{p-1} = 1$$

$$\downarrow \lim_{n \rightarrow p^-} \frac{|n-p|}{(n-p)(n+p)}$$

$$\lim_{n \rightarrow p^-} \frac{-(n-p)}{(n-p)(n+p)} = -\frac{1}{n+p} = -\frac{1}{p-1} = -1$$

$$\text{ب) } \lim_{n \rightarrow 1} \frac{n - [n]}{n^2 - 1} \quad \boxed{\text{الحد}}$$

$$\lim_{n \rightarrow 1^+} \frac{n-1}{(n-1)(n+1)} = \frac{1}{n+1} = \frac{1}{2}$$

$$\lim_{n \rightarrow 1^-} \frac{n-0}{(n-1)(n+1)} = \frac{1}{0^-} = -\infty$$