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دوازدهم

کتاب ۲۱

کتابخانه

$$\frac{\sqrt{4x^2 + (m+r)x + \frac{m}{r}}}{|2x^2 + (m-r)x + a^2|} \xrightarrow{\text{از اعداد}} \frac{4a^2 + (m+r)a + \frac{m}{r}}{|2a^2 + (m-r)a + a^2|} = 0 \rightarrow a^2(2a+m-r) = 0$$

$a=0 \Rightarrow x=a \cdot 0 \cdot 0 \cdot 0$ (1)

$2a+m-r=0$
 $2a=r-m$
 $m=r-2a$

$x=a \Rightarrow \sqrt{4a^2 + (r-2a)a + \frac{r-2a}{r}} = 0 \rightarrow 4a^2 + ra - 2a^2 + 1 = 0$
 $(2a+1)^2 = 0 \rightarrow a = -\frac{1}{2}$
 $m = r$

$$\Rightarrow \frac{\sqrt{4x^2 + 4x + \frac{r}{r}}}{|2x^2 + \frac{1}{2}|} \Rightarrow \frac{\sqrt{\frac{r}{r}}}{|x^2 - \frac{x}{r} + \frac{1}{2}|} = \frac{r \tan b}{\sqrt{x}}$$

$\rightarrow x = -\frac{1}{r} \Rightarrow \frac{\sqrt{\frac{r}{r}}}{\frac{r}{r}} = \frac{r \tan b}{\sqrt{\frac{1}{r}}} = \tan b = \frac{\sqrt{r}}{r} \rightarrow b \begin{cases} \frac{\pi}{4} \text{ صحیح} \\ \frac{3\pi}{4} \text{ صحیح} \end{cases}$

$$f(x) = \frac{x^2 + ax + b}{x-1} \rightarrow \left. \begin{matrix} \text{با } x=1 \\ \text{مخرج صفر شود} \end{matrix} \right\} x=1 \rightarrow \left. \begin{matrix} 1+a+b=0 \\ a-a+b=0 \end{matrix} \right\} \rightarrow \begin{matrix} b=-1-a \\ b=a \end{matrix}$$

$$\left[\frac{b-2a}{r} \right] = \left[\frac{-1-a-2a}{r} \right] = \left[\frac{-1-3a}{r} \right] = \left[\frac{-1}{r} \right] = -\frac{1}{r}$$

$4+2b=0 \rightarrow b=-2$
 $a=2$

$$f(x) = \begin{cases} \tan \frac{(x+1)\pi}{r} & x \leq 1 \\ \frac{|x^2 + x - r|}{a(1-x)} & 1 < x < a \\ b(x - [-x]) & x \geq a \end{cases}$$

$x=1 \rightarrow \tan \frac{2\pi}{r} = -1$
 $\frac{x+r}{-a} = -1 \rightarrow a=r$

$1 < x < a \rightarrow \frac{|(x+r)(x-1)|}{-a(x-1)} \xrightarrow{\text{با } x=1} \frac{(x+r)(x-1)}{-a(x-1)} = \frac{x+r}{-a}$

$x \geq a \rightarrow x=a \rightarrow b(a+r) = -\frac{r}{r} \rightarrow 11b = -\frac{r}{r} \rightarrow b = -\frac{r}{r}$

$ab = -\frac{r}{r} \cdot r = -\frac{r}{r}$

$\lim_{x \rightarrow a^-} f(x) = \lim_{x \rightarrow a^-} \frac{|a^2 + a - r|}{r(1-a)} = \lim_{x \rightarrow a^-} \frac{|a+a-r|}{r(1-a)} = \frac{-r}{r} = -\frac{r}{r}$

$f(x) = a[x+1] + b[x+[a+1]] \xrightarrow{\text{با } x=a} a[a+1] + b[a+[a+1]] = a[a+1] + b[2a+1]$

$f(a) = a[a] + a+b[a] + b[a] + b \rightarrow (a+b)[a] + a+b = -a[a]$

$\Rightarrow \frac{a[a]}{f(a)} = \frac{a[a]}{-a[a]} = -1$

$x=0^+ \rightarrow a+b[a]+b = u$
 $x=0^- \rightarrow b[a] = u$
 $a+b+b[a] = b[a]$
 $a = -b$

Parsian

سوال ۵)

$$b=0 \rightarrow f(a) = -ka \rightarrow \frac{a}{f(b)} = \frac{a}{-ka} = -\frac{1}{k}$$

سوال ۶)

$$f(ka) = 0 \rightarrow a = ka \rightarrow \text{ریشه ضرورت}$$

$$a = a \rightarrow \text{ریشه ضرورت} + \text{ریشه غرض}$$

$$f(a) = \frac{(a-a)(a-ka)}{-(a-a)} = -(a-ka) \rightarrow f(a) = \begin{cases} -(a-ka) & a \neq a \\ k & a = a \end{cases}$$

$$f(a) = -(a-ka) = k \rightarrow a = k$$

$$f(a) = \frac{(a-a)(a-ka)}{-(a-a)} = \frac{(a-k)(a-k)}{-(a-k)} = \frac{a^2 - 4a + 4}{-(a-k)} = \frac{a^2 + ma + n}{-(a-k)}$$

$$m = -4, n = 4 \rightarrow n - m = 4 - (-4) = 8$$

$$\text{حد اول} = (1-a)[z^+] + (ka^r - 1)[-z^+] = (1-a)z + (ka^r - 1)(-z - 1) \quad (I)$$

سوال ۷)

$$\text{حد دوم} = (1-a)[z^-] + (ka^r - 1)[-z^-] = (1-a)(z - 1) + (ka^r - 1)(-z) \quad (II)$$

$$I, II \rightarrow \lim_{a \rightarrow z^+} f(a) = \lim_{a \rightarrow z^-} f(a) \rightarrow -1 + a = -ka^r + 1 \rightarrow ka^r + a - 1 = 0 \rightarrow \begin{cases} a = -1 \\ a = \frac{1}{k} \end{cases} \times$$

$$a = \frac{1}{k} \rightarrow b \sin\left(\frac{\pi}{\frac{1}{k}}\right) = -b \rightarrow -b = -\frac{1}{k} \rightarrow b = \frac{1}{k} \quad \frac{a}{b} = \frac{\frac{1}{k}}{\frac{1}{k}} = 1$$

$$\lim_{n \rightarrow \frac{1}{m}} \frac{|(a-1)(a+m+1)|}{|(a-1)(a+1)| + |a-1|} = \frac{|a-1||a+m+1|}{|a-1|(m|a+1|+1)} = \frac{|m+2|}{km+1} = \frac{m}{m+2}$$

سوال ۸)

$$m \gg -2 \rightarrow m^2 + fm + f = km^2 + m \rightarrow m^2 - km - f = 0 \rightarrow \begin{cases} m = -1 \\ m = f \end{cases}$$

$$m = f \rightarrow \frac{|a^2 + f(a-a)|}{f|a-1||a+1| + |a-1|} = \frac{|a-1||a+a|}{|a-1|(f|a+1|+1)} \rightarrow \lim_{a \rightarrow \frac{1}{f}} \frac{a + \frac{1}{f}}{f \times \frac{a}{f} + 1} = \frac{\frac{1}{f}}{1} = \frac{1}{f}$$

$$m = -1 \rightarrow \frac{|a^2 - a|}{-|a-1||a+1| + |a-1|} = \frac{|a||a-1|}{|a-1|(-|a+1|+1)} \quad \times$$

$$u=a \rightarrow \text{مشتق را بیرون بکش}$$

$$a^r + a = 0 \rightarrow a(a+1) = 0 \rightarrow \begin{cases} a=0 \text{ X} \\ a=-1 \checkmark \end{cases}$$

$$a^m + a(m-r) + a^r = 0 \xrightarrow{a=-1} -1 - m + r + 1 = 0 \rightarrow m=r$$

$$\lim_{u \rightarrow -1} \frac{\sqrt{r} |-u-1|}{|u^m+1|} = \frac{\sqrt{r} |-(u+1)|}{|(u+1)(u^r-u+1)|} = \frac{\sqrt{r}}{r}$$

$$\lim_{u \rightarrow 0^+} \frac{u^r + |u|}{u^r + a|u|} = \frac{0}{0} \rightarrow \lim_{u \rightarrow 0^+} \frac{u^r + u}{u^r + a u} = \lim_{u \rightarrow 0^+} \frac{u(u+1)}{u(a+u)} = \frac{1}{a}$$

$$\lim_{u \rightarrow 0^-} \frac{u^r + |u|}{u^r + a|u|} = \frac{0}{0} \rightarrow \lim_{u \rightarrow 0^-} \frac{u^r - u}{u^r - a u} = \lim_{u \rightarrow 0^-} \frac{u(u-1)}{u(u-a)} = \frac{-1}{-a} = \frac{1}{a}$$

$$f'(-) = \frac{r a - 1}{r a + r} = \frac{1}{a} \rightarrow r a^r - a = r a + r \rightarrow r a^r - r a - r = 0 \rightarrow \begin{cases} a=r \\ a=\frac{1}{r} \text{ X} \end{cases}$$

$$a=r \rightarrow \lim_{u \rightarrow \frac{1}{r}} f(u) = \lim_{u \rightarrow \frac{1}{r}} \frac{u^r + u}{u^r + r u} = \frac{\frac{1}{r^r} + \frac{1}{r}}{\frac{1}{r^r} + 1} = \frac{\frac{r}{r^r}}{\frac{r}{r^r} + 1} = \frac{r}{r+1}$$