

یکی از ریشه های معادله $ax^2 - ax + b = 0$ برابر ۱ است.

از طرفی برای اینکه تابع $f(x)$ در $x=1$ جواب نداشته باشد باید کسرها $\frac{0}{0}$ شود:

خواسته سوال $\rightarrow a=2 \quad b=-3$

ولی بیرون نیست $\Rightarrow f(x) = \frac{0}{0} \Rightarrow x=1 \Rightarrow$

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در بازه $(1, \infty)$ بیرون است.

$f(1) = \frac{1+a+b}{0} = \frac{0}{0} \rightarrow a+b=-1$ (II)

(I) و (II) $\rightarrow a=2 \quad b=-3$

$f(1) = \lim_{x \rightarrow 1^+} f(x) \Rightarrow \tan \frac{\pi x}{\varepsilon} = \lim_{x \rightarrow 1^+} \frac{|x^2 + x - 2|}{-a(x-1)}$

$-1 = \frac{(x-1)(x+2)}{-a(x-1)} \Rightarrow \frac{x+2}{a} = 1 \xrightarrow{x=1} a=3$

$f(1) = \lim_{x \rightarrow 1^-} f(x) \Rightarrow \lim_{x \rightarrow 1^-} \frac{x+2}{-a} = \frac{3}{-a} \Rightarrow b = -\frac{7}{3}$

$\rightarrow ab = \frac{-7}{10}$

$f(x) = a[x] + a + b[x] + b[a+1] = (a+b)[x] + a + b[a+1]$

$\lim_{x \rightarrow K^+} f(x) = \lim_{x \rightarrow K^-} f(x) \Rightarrow (a+b)K + a + b[a+1] = (a+b)(K-1) + a + b[a+1]$

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

$f(x) \rightarrow a - a[a+1] = a - a[a] - a \rightarrow f(x) = -a[a]$ خواسته سوال $= \frac{a[a]}{-a[a]} = -1$

$f(x) = b[x] + b[x-a] - 2a = 2b[x] - ab - 2a$

$\lim_{x \rightarrow K^+} f(x) = \lim_{x \rightarrow K^-} f(x) \Rightarrow 2b(K) - ab - 2a = 2b(K-1) - ab - 2a$

$\rightarrow 2b=0 \rightarrow b=0$

$f(x) \rightarrow f(x) = -2a$ خواسته سوال $\rightarrow \frac{a}{-2a} = -\frac{1}{2}$

$$\lim_{x \rightarrow a} \frac{a^r + am + n}{-1} = r \Rightarrow \frac{a^r + am + n}{-1} = r \Rightarrow n = -a^r - am$$

$$\text{HOP} \rightarrow \frac{r x + m}{-1} = r \xrightarrow{x=a} m = -r a - r$$

$$f(r a) = 0 \Rightarrow \frac{\{a^r + r a m + n\}}{-a} = 0 \Rightarrow \{a^r + r a m + n\} = 0 \Rightarrow m = -r a$$

$$\left. \begin{matrix} m = -r a \\ m = -r a - r \end{matrix} \right\} \rightarrow a = r \rightarrow m = -r \rightarrow n = 1 \quad \text{مطلوب} = n - m = 1 - (-r) = 1 + r$$

$$f(1) = \lim_{x \rightarrow 1^+} f(x) = \lim_{x \rightarrow 1^-} f(x) \Rightarrow b \sin\left(\frac{\pi}{a}\right) = 1 - r a^r - a = 1 - r a^r$$

$$a = \frac{r}{r}, a = -1 \leftarrow r a^r + a - r = 0$$

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

$$f(1) = \lim_{x \rightarrow 1^+} f(x) \Rightarrow \frac{m}{m+r} = \frac{x^r + m x - (m+1)}{m(x^r - 1) + (x-1)} \rightarrow a+b+c=0 \left[\begin{matrix} x=1 \\ x=-(m+1) \end{matrix} \right]$$

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

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

$$f(x) = \frac{\sqrt{r} |a(x+1)|}{|x^r + (m-r)x + a^r|} \xrightarrow{\text{مطلوب}} \sqrt{r} |a(x+1)| = 0 \quad \boxed{x=-1}$$

$$\text{مطلوب} \rightarrow (-1)^r + (m-r)(-1) + (-1)^r = 0 \rightarrow m = r$$

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

$$f(0) = \lim_{x \rightarrow 0^+} \frac{x^r + |a|}{x^r + a|x|} \Rightarrow \frac{1-a-1}{r a + r} = \frac{r+1}{r+a} \xrightarrow{x=0} r a^r - r a - r = 0 \quad a = r \quad a = \frac{1}{r}$$

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

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