محمدعماد [illegible] / دوازدهم ریاضی A

۱۷/۵

۱- ضرایب ثابت باشد =>

$9x^2+(m+3)x+\frac{m}{2}$

$\to \frac{m}{2}+6=m+3 \leadsto m+12=2m+6$ ۰

$\boxed{m=6}$

$\Rightarrow \frac{\sqrt{9x^2+9x+3}}{|12x^3+3x^2+a^2|} \leadsto a^2+2=3 \to a^2=1 \to a=\pm1$

غ ق ق

$a=-1$

$\frac{2\tan b}{\sqrt{-(-1)}}=2\tan b=0 \to \tan b=0$

یا $b=\{0,\pi\}$

پایین صفحه

۲- تابع $f(x)$ در $x=1$ ناپیوسته است و چون حد دارد باید ریشه صورت هم باشد

$\leadsto x=1 \to 1+a+b=0$

$\leadsto x=1 \to 5-a+b=0$

$\begin{cases} a+b=-1\\ b-a=-5\end{cases} \to a=2, b=-3$ ۲

$\Rightarrow [\frac{b-2a}{3}]=[\frac{-3-4}{3}]=\boxed{-3}$

۳- $f(1)=\tan(\frac{3\pi}{4})=-1$

$\lim_{x\to1^+} f(x)=\lim_{x\to1^+}\frac{(x+2)(x-1)}{a(1-x)}=-1$

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

$f(5)=\lim_{x\to5^+} f(x) \leadsto b(5-[-5])$

$=\lim_{x\to5^-}\frac{(x+2)(x-1)}{3(1-x)} \Rightarrow \frac{-7}{3}=10b$ ۲

$b=-\frac{7}{30} \Rightarrow ab=3\times(-\frac{7}{30})=\boxed{-0.7}$

۴- $f(x)=a[x]+a+b[x]\pm b[a]+b$

$(a+b)[x]+\cancel{a}^{-b}+b[a]+b$

$=0 \to a=-b$

$\Rightarrow f(x)=b[-b]$ یا $f(x)=-a[a]$

$\Rightarrow \frac{a[a]}{-a[a]}=\boxed{-1}$ ۲

۵- تابع در R پیوسته => جزء صحیح نداریم $b=0$

$\leadsto f(x)=-2a \to \frac{a}{f(b)}=\frac{a}{f(0)}=\frac{a}{-2a}=\boxed{-\frac{1}{2}}$ ۲

۶- $f(2a)=0 \leadsto x=2a$ ریشه صورت

$x=a \to$ ریشه مخرج

$f(x)=\frac{(x-2)(x-4)}{-(x-2)}$ ۲

$f(x)=\frac{(x-a)(x-2a)}{-(x-a)}=-(x-2a)$ $\qquad \frac{x^2-6x+8}{-(x-2)}$

$f(x)=\begin{cases}-(x-2a) & x\neq a\\ 2 & x=a\end{cases} \to f(a)=-(a-2a)=2 \Rightarrow a=2$

$\Rightarrow m=-6, n=8 \leadsto n-m=8-(-6)=\boxed{14}$

۷- اگر $x=\alpha \leadsto \alpha^+ \leadsto \begin{cases}[x]=\alpha\\ [-x]=-\alpha-1\end{cases}$

$\lim_{x\to\alpha^+} f(x)=(1-a)\alpha+(3a^2-1)(-\alpha-1)$

$\Rightarrow (-3a^2-a+2)\alpha+(-3a^2+1)$

$\alpha^- \leadsto x<\alpha \begin{cases}[x]=\alpha-1\\ [-x]=-\alpha\end{cases}$

$\lim_{x\to\alpha^-} f(x)=(1-a)(\alpha-1)+(3a^2-1)(-\alpha)$

$=(a-1)+\alpha(-3a^2-a+2)$

$\Rightarrow 1-3a^2=a-1 \leadsto 3a^2+a-2=0$

$\Rightarrow a=\frac{2}{3}, -1$ پیوسته نیست $\leadsto$ غ ق ق

-۱۰

$$\lim_{x\to 0^+} \frac{x^2+|x|}{x^2+a|x|} = \frac{0}{0} \rightsquigarrow \frac{x^2+x}{x^2+ax} \xrightarrow{hop} \frac{2x+1}{2x+a}$$

$$= \frac{1}{a}$$

$$\lim_{x\to 0^-} \frac{x^2-x}{x^2-ax} \xrightarrow{hop} \frac{2x-1}{2x-a} = \frac{1}{a}$$

2

$$f(a) = \frac{2a-1}{2a+2} = \frac{1}{a} \to 2a^2 - a = 2a+2$$

$$2a^2 - 3a - 2 = 0 \to a=2 \quad , \quad a=-\frac{1}{2}$$ غیر قابل قبول

$$a=2 \rightsquigarrow \lim_{x\to \frac{1}{2}} f(x) = \lim_{x\to \frac{1}{2}} \frac{x^2+x}{x^2+2x} = \frac{\frac{1}{4}+\frac{1}{2}}{\frac{1}{4}+1}$$

$$= \frac{3}{4} \times \frac{4}{5} = \frac{3}{5}$$

$$m=4 \to \frac{|x^2+4x-5|}{4|x-1||x+1|+|x-1|} = \frac{|x-1||x+5|}{|x-1|(4|x+1|+1)} \to$$

$$\to \lim_{x\to \frac{1}{4}} \frac{5+\frac{1}{4}}{4\times\frac{5}{4}+1} = \frac{\frac{21}{4}}{6} = \frac{7}{8}$$

$$m=-1 \to \frac{|x^2-x|}{-|x-1||x+1|+|x-1|} = \frac{|x||x-1|}{|x-1|(-|x+1|+1)}$$ ✗

$$\lim_{x\to a^+} f(x) = (-3a^2+2-a)\alpha + (1-3a^2)$$

$$= 0 + 1 - 3\left(\frac{2}{3}\right)^2 = -\frac{1}{3}$$

2

$$f(a) = b\cot\left(\frac{\pi}{\frac{2}{3}}\right) = b\cot\frac{3\pi}{2} \Rightarrow -b = -\frac{1}{3}$$

$$\rightsquigarrow b = \frac{1}{3}$$

$$\frac{a}{b} = \frac{2}{3} \times \frac{3}{1} = \boxed{2}$$

-۸

$$\frac{|(x+1)(x-1) + m(x-1)|}{m(|x-1|)(|x+1|)+|x-1|}$$

1.5

$$\frac{|(x-1)|(|x+1+m|)}{|x-1|(m(|x|+1)+1)} \Rightarrow \frac{|x+1+m|}{mx+m-1} \xrightarrow{x\to 1}$$

$$\frac{2+m}{2m-1} = \frac{m}{m+2} \rightsquigarrow m^2+4m+4 = 2m^2-m$$

$$m^2-5m-4=0$$

???

-۹

$$D_f = \mathbb{R} - \{a\}$$

$$|ax+a| = 0 \xrightarrow{x=a} |a^2+a| = 0$$

$$\Rightarrow a(a+1) = 0 \begin{cases} a=0 \text{ غ ق ق } \to a=0 \Rightarrow f(x)=0 \\ a=-1 \end{cases}$$

$$|x^3+(m-2)x+a^2| = 0 \xrightarrow[a=-1]{x=-1}$$

2

$$|-1+(m-2)(-1)+1| = 0 \to |2-m| = 0 \to m=2$$

$$\lim_{x\to a} f(x) = \lim_{x\to -1} \frac{\sqrt{3}|-x-1|}{|x^3+1|} = \frac{\sqrt{3}|x+1|}{|x+1||x^2-x+1|}$$

$$= \boxed{\frac{\sqrt{3}}{3}}$$

سوال ۱)

$a \leftarrow$ صفر شدن مخرج را دنبال و باید مخرج را هم صفر کند

$\Delta = 0 \rightarrow (m+3)^2 - 4\left(\frac{m}{2}\right)\times 6 = 0 \rightarrow m^2+6m+9-12m=0 \rightarrow m^2-6m+9=0 \rightarrow m=3$

$$\lim_{x\to a} \frac{\sqrt{6x^2+6x+\frac{3}{2}}}{|2x^3+a^2|} = \frac{\sqrt{6\left(x^2+x+\frac{1}{4}\right)}}{|2x^3+a^2|} = \frac{\sqrt{6}\left|x+\frac{1}{2}\right|}{|2x^3+a^2|}$$

$$2a^3+a^2=0 \rightarrow a^2(2a+1)=0 \rightarrow \begin{cases} a=0 \longrightarrow \frac{\text{عدد}}{0} \quad \times \\ a=-\frac{1}{2} \rightarrow \frac{\sqrt{6}\left|x+\frac{1}{2}\right|}{\left|2x^3+\frac{1}{4}\right|} = \frac{0}{0} \quad \checkmark \end{cases}$$

$$\lim_{x\to -\frac{1}{2}} \frac{\sqrt{6}\left|x+\frac{1}{2}\right|}{2\left|x^3+\frac{1}{8}\right|} = \frac{\sqrt{6}\left|x+\frac{1}{2}\right|}{2\left|x+\frac{1}{2}\right|\left|x^2-\frac{1}{2}x+\frac{1}{4}\right|} = \frac{2\sqrt{6}}{3}$$

$$\frac{2\tan b}{\sqrt{-\left(-\frac{1}{2}\right)}} = \frac{2\sqrt{6}}{3} \rightarrow \tan b = \frac{\sqrt{3}}{3} \rightarrow b = \frac{\pi}{6}$$