① $\sqrt{2x^2+(m+3)x+\frac{m}{2}} \Rightarrow \Delta \le 0 \Rightarrow (m+3)^2 - 4\times\frac{3m}{2} \le 0 \Rightarrow (m-3)^2 \le 0 \Rightarrow \boxed{m = 3}$ ①

$\left(a=-\frac{1}{2}\right) \Rightarrow$ در کار آید

رفع ابهام صورت و مخرج $\Rightarrow \frac{\sqrt{4x^2+4x+1}}{|4x^3+\frac{1}{2}|} \Rightarrow x \to -\frac{1}{2}^+ \Rightarrow \frac{\sqrt{4}\,(x+\frac{1}{2})^2}{\frac{1}{2}(8x^3+\frac{1}{8})} = \frac{1}{2}\,\frac{\cancel{|x+\frac{1}{2}|}\sqrt{6}}{\cancel{(x+\frac{1}{2})}(x^2-\frac{1}{2}x+\frac{1}{4})} = \frac{\sqrt{6}}{2(x^2-\frac{x}{2}+\frac{1}{4})}$

$$\lim_{x\to -\frac{1}{2}^-} f(x) = \lim_{x\to -\frac{1}{2}^+} \frac{\sqrt{6}}{2(x^2-\frac{x}{2}+\frac{1}{4})} = \frac{\sqrt{6}}{2(\frac{1}{4}+\frac{1}{4}+\frac{1}{4})} = \frac{\sqrt{6}}{\frac{3}{2}} = \frac{2\sqrt{6}}{3}$$

②

$\Rightarrow f(a) = f(-\frac{1}{2}) = \frac{2\tan b}{\frac{1}{\sqrt{2}}} = \frac{2\sqrt{6}}{3} \Rightarrow 2\sqrt{2}\tan b = \frac{2\sqrt{6}}{3} \Rightarrow \tan b = \frac{\sqrt{3}}{3}$

$\Rightarrow 0 < b < \pi \Rightarrow \boxed{b = \frac{\pi}{6}}$

دلیل $a=-\frac{1}{2}$ ⇐ مخرج در به صورت پس حتماً $\frac{1}{2}$ ریشه دارد (دو تا یی) و آن a است

$\Rightarrow 2a^3+a^2=0 \Rightarrow a^2(2a+1)=0 \Rightarrow a=-\frac{1}{2}$

$a \neq 0$

۱۷

نام و نام خانوادگی ....[illegible]........ پاسخنامه تشریحی تکلیف شماره ..۱۲.. کلاس ....۸....

۲ ②

$\Rightarrow x = 1 \rightarrow$ [illegible] $\Rightarrow f(x) = \dfrac{x^2 + ax + b}{x - 1} \Rightarrow 1 + a + b = 0$

$\Rightarrow b + a = -1$

$5x^2 - ax + b = 0 \overset{x=1}{\Longrightarrow} 5 - a + b \rightarrow b - a = -5$

$$\Rightarrow \begin{array}{l} b - a = -5 \\ b + a = -1 \\ \hline 2b = -6 \end{array} \rightarrow \boxed{b = -3} \; \boxed{a = 2} \rightarrow \left[\dfrac{b - 3a}{3}\right] = \left[\dfrac{-3 - 6}{3}\right] = \boxed{-3}$$

۱,۵

۳

پیوستگی در ۱ $\rightarrow x \leq 1 \Rightarrow \tan\frac{3\pi}{4} = -1$ و $x > 1 \Rightarrow \frac{(x-1)(x+2)}{a(1-x)} = \frac{-3}{a} \Rightarrow \frac{-3}{a} = -1 \Rightarrow \boxed{a = 3}$

درون پیوستگی $\rightarrow 5^{+} \rightarrow b(5-(-6)) = 11b \Rightarrow \frac{x^2+x-2}{3(1-x)} = \frac{28}{-12} = \frac{-7}{3} \Rightarrow 11b = \frac{-7}{3} \Rightarrow b = \frac{-7}{33}$

$ab = \frac{-7}{33} \times 3 = \frac{-7}{11}$

$f(5) = b(5-[-5]) = b(5+5) = 10b$

$\lim\limits_{x\to 5^-} f(x) = \lim\limits_{x\to 5^-} \frac{|x^2+x-2|}{3(1-x)} = \lim\limits_{x\to 5^-} \frac{|25+5-2|}{3(1-5)} = \frac{-28}{12} = \frac{-7}{3}$

$\rightarrow 10b = \frac{-7}{3}$

$\boxed{b = \frac{-7}{30}}$

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

$[x+1] \to x=k-1$ پله در نقاط و $[x+[a+1]] \to x=k-[a+1]$ پله در نقاط

نقاط پله‌ی f همزمان هستند $\Leftarrow a+b=0$

$\Rightarrow -a=b \Rightarrow f(x)=a[x+1]-a[x+[a+1]] \Rightarrow k=[a] \Rightarrow [a+1]=k+1$ ۴

$[x+1]=[x]+1$ و $[x+[a+1]]=[x+k+1]=[x]+k+1$

$\Rightarrow f(x)=a(([x]+1)-([x]+k+1))=a(-k)=-a[a] \Rightarrow f(a)=-a[a]$

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

۲

چون f ضرب تابع براکتی است پس برای پیوستگی باید $b=0$ باشد

$f(x)=-2a \Rightarrow f(b)=-2a \Rightarrow \dfrac{a}{f(b)}=\dfrac{a}{-2a}=\boxed{-\dfrac{1}{2}}$ ۵

۲

(۱) $f(2a)=n \Rightarrow 2a$ ریشه صورت (۲) پیوسته در $R \Rightarrow \frac{x^2+mx+n}{a-x}$ $x=2a$ ریشه صورت

$\Rightarrow \frac{(x-a)(x-2a)}{(a-x)} = -(x-2a) \Rightarrow x=a \Rightarrow -(-a)=2 \Rightarrow \boxed{a=2}$

$\Rightarrow (x-a)(x-2a) = x^2-3ax+2a^2 \Rightarrow \boxed{n-m=2a^2+3a=8+6=14}$ ۴

۲

$x\to1^+ \Rightarrow (1-a)+(-4a^2+2) \Rightarrow -4a^2-a+3$

$x\to1^- \Rightarrow -3a^2+1 \Rightarrow -4a^2-a+3=-3a^2+1 \Rightarrow 3a^2+a-2=0$

$a=-1$ یا $\frac{2}{3} \Rightarrow$ if $a=-1 \Rightarrow b\sin(\frac{\pi}{-1})=0$ ✗

if $a=\frac{2}{3} \Rightarrow b\sin\frac{3\pi}{2}=-b$ ✓ $\Rightarrow f(x)\begin{cases} \frac{1}{3}[x]+\frac{1}{3}[-x] & x\notin Z \\ -b & x\in Z \end{cases}$ ۲

$\Rightarrow -b=\frac{1}{3}(\underbrace{[x]+[-x]}_{x\notin Z \Rightarrow =-1}) \Rightarrow -b=-\frac{1}{3} \Rightarrow \boxed{b=\frac{1}{3}} \Rightarrow \frac{a}{b}=\frac{\frac{2}{3}}{\frac{1}{3}}=\boxed{2}$

۲

1,5

5

$$\lim_{x\to 1}\frac{|x^2+mx-m-1|}{|x^2-1|\left(m(|x+1|+1)\right)}=\frac{|x-1||x+m+1|}{|x-1|\left(m|x+1|+1\right)}=\frac{|2+m|}{2m+1}$$

$$\Rightarrow \frac{m}{m+2}=\frac{|m+2|}{2m+1}\begin{cases} \xrightarrow{m>-2} m^2+4m+4=2m^2+m\Rightarrow m^2-3m-4=0\Rightarrow (m-4)(m+1)=0 \\ \xrightarrow{m<-2} -m^2-4m-4=2m^2+m\Rightarrow 3m^2+5m+4=0 \ \times \end{cases}$$

$$m=4,-1\Rightarrow \lim_{x\to -1} f(x)=\frac{|x^2+4x-4-1|}{4|x^2-1|+|x-1|}=\frac{8}{2}=\boxed{4}$$

$$\lim_{x\to \frac{1}{4}}\frac{|x^2+4x-5|}{4|x^2-1|+|x-1|}=\boxed{\frac{6{,}3}{4{,}5}}$$

$$m=4\to\frac{|x^2+4x-5|}{4|x-1||x+1|+|x-1|}=\frac{|x-1||x+5|}{|x-1|\left(4|x+1|+1\right)}\to\lim_{x\to\frac{1}{4}}\frac{5+\frac{1}{4}}{4\times\frac{5}{4}+1}=\frac{\frac{21}{4}}{6}=\frac{7}{8}$$

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

$x=a \rightarrow$ ریشه‌ی صورت و مخرج

$a^2+a=0 \rightarrow a(a+1)=0 \rightarrow \begin{cases} a=0 \; \times \\ a=-1 \; \checkmark \end{cases}$

$a^3+a(m-2)+a^2=0 \xrightarrow{a=-1} -1-m+2+1=0 \rightarrow m=2$

a ریشه‌ی مخرج $\Rightarrow a^3+(m-2)a+a^2=0 \Rightarrow a^2+a+(m-2)=0 \Rightarrow \underset{\text{یک جواب}}{\Delta=0}$ $a\neq 0$ $\Rightarrow 1-4m+8=9-4m=0 \Rightarrow m=\frac{9}{4} \Rightarrow \boxed{a=-\frac{1}{2}}$ $f(x)=\frac{\sqrt{3}\,\lvert 1-\frac{1}{2}x-\frac{1}{2}\rvert}{\lvert x^3+\frac{1}{2}x+\frac{1}{2}\rvert} \Rightarrow \lim_{x\to -\frac{1}{2}^+} \frac{\sqrt{3}(\frac{1}{2}x+\frac{1}{2})}{x(x^2+\frac{1}{2}x+\frac{1}{2})} \overset{\text{Hop}}{\Rightarrow} \frac{\frac{\sqrt{3}}{2}}{3x^2+\frac{1}{2}} = \frac{\frac{\sqrt{3}}{2}}{\frac{5}{4}} = \boxed{\frac{4\sqrt{3}}{5}}$ ۰/۵ $\lim_{x\to -1} \frac{\sqrt{3}\,\lvert -x-1\rvert}{\lvert x^3+1\rvert} = \frac{\sqrt{3}\,\lvert -(x+1)\rvert}{\lvert (x+1)(x^2-x+1)\rvert} = \frac{\sqrt{3}}{3}$		۹
$x\to 0^+ \Rightarrow \frac{x^2+x}{x^2+ax} = \frac{x+1}{x+a} \Rightarrow \underset{\text{پیوستہ}}{x=0} \Rightarrow \frac{1}{a} = \frac{2a-1}{2a+2} \Rightarrow 2a^2-3a-2=0 \begin{cases} \rightarrow a=2 \; \checkmark \\ \rightarrow a=-\frac{1}{2} \end{cases}$ $\lim_{x\to\frac{1}{2}} f(x) \Rightarrow \lim_{x\to\frac{1}{2}} \frac{x+1}{x+2} = \boxed{\frac{3}{5}}$ ۱/۵ $\lim_{x\to -2} f(x) \Rightarrow \lim_{x\to 2} \frac{x+1}{x+\frac{1}{2}} = \boxed{\frac{2}{5}}$		۱۰

$f(0)=\frac{2a-1}{2a+2}=\frac{1}{a} \rightarrow 2a^2-a=2a+2 \rightarrow 2a^2-3a-2=0 \rightarrow \begin{cases} a=2 \\ a=-\frac{1}{2} \; \times \end{cases}$

$a=2 \rightarrow \lim_{x\to\frac{1}{2}} f(x) = \lim_{x\to\frac{1}{2}} \frac{x^2+x}{x^2+2x} = \frac{\frac{1}{4}+\frac{1}{2}}{\frac{1}{4}+1} = \frac{\frac{3}{4}}{\frac{5}{4}} = \frac{3}{5}$