«پاسخ کلاس رسمی» «دوازدهم رشته A» «تکلیف ۲۵»

① $\dfrac{f(3)-f(1)}{3-1}=\dfrac{(1-\frac{a}{3})-(1-a)}{2}=\dfrac{\frac{2}{3}a}{2}=\dfrac{a}{3}$

$f(x)=1-\dfrac{a}{x}\Rightarrow f'=\dfrac{a}{x^2}\rightarrow \dfrac{a}{3}=\dfrac{a}{x^2}\longrightarrow x=\pm\sqrt{3}\xrightarrow{x\in[1,3]}\boxed{x=\sqrt{3}}$

② $y=-x\Rightarrow 2ax^2-5x+18a=-x\rightarrow 2ax^2-4x+18a=0$

$\Delta=0\rightarrow 16-144a^2\rightarrow \cancel{16}^{4}=\cancel{144}^{36}a^2\rightarrow a^2=\dfrac{1}{9}\rightarrow a=\pm\dfrac{1}{3}\rightarrow\boxed{a=-\dfrac{1}{3}}$

③ $y=x^3-12x+2\longrightarrow 3x^2-12=0\longrightarrow x=\pm 2\longrightarrow$

	-2		2	
$+$		$-$		$+$
$\nearrow$		$\searrow$	min	$\nearrow$

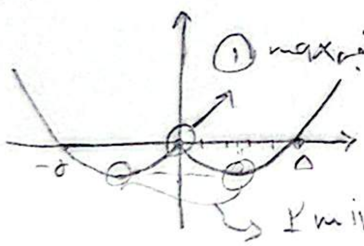
مینیمم نسبی تابع (۲)

④ $y=x^3+ax^2-2bx-4\longrightarrow 3x^2+2ax-2b\xrightarrow{x=0}\boxed{b=0}$

$\downarrow$ $x^3-3x^2-4\ /\ \cancel{-8}\cancel{-12}-4=$ $\xrightarrow{x=-2}$ $12-4a=0\longrightarrow\boxed{a=3}$

$(0,-4)\quad(-2,-24)\Rightarrow\sqrt{4+784}=\sqrt{788}=2\sqrt{197}$

⑤ $f(x)=x^2-5|x|\xrightarrow{\text{نقاط بحرانی}}$ ① $x=0$, ② $x^2-5x\longrightarrow\boxed{x=5}$, $\boxed{x=0}$



① max نسبی $=m$ $\dfrac{-b}{2a}=\dfrac{5}{2}=2/5$ $\quad+\dfrac{25}{4}-\dfrac{50}{4}=-\dfrac{25}{4}=-6/25$

2 min نسبی $=n$

$\longrightarrow\dfrac{n}{m}=2$

⑥

(7) $0 \le x \le a \xrightarrow{-a} -a \le x-a \le 0 \to |x-a| = a-x$

$f(x) = \sqrt[3]{x^2}\,(a-x) = ax^{\frac{2}{3}} - x^{\frac{5}{3}} \longrightarrow f'(x) = \frac{2}{3}ax^{-\frac{1}{3}} - \frac{5}{3}x^{\frac{2}{3}} = \frac{2}{3}x^{-\frac{1}{3}}\left(a - \frac{5}{2}x\right)$

$f'(x) = \dfrac{2(a - \frac{5}{2}x)}{3\sqrt[3]{x}}$ نقاط بحرانی: $a = x \,,\, x = 0 \,,\, x = \frac{2}{5}a$ $\quad f(a) = f(0) = 0$

$f(\frac{2}{5}a) = 1.5 \to \sqrt[3]{(\frac{2}{5}a)^2(a - \frac{2}{5}a)} = \frac{3}{2} \xrightarrow{\text{توان } 3} \frac{4}{25}a^2 \times \frac{\cancel{27}}{125}a^3 = \frac{\cancel{27}}{8}$

$\dfrac{4a^5}{25 \times 125} = \dfrac{1}{8} \to a^5 = \dfrac{25 \times 125}{4 \times 8} = \dfrac{5^5}{2^5} \to \boxed{a = \frac{5}{2} = 2.5}$

(8)

(9) $y = \dfrac{mx+2}{x-1+m} \to y' = \dfrac{m(m-1)-2}{(x-1+m)^2} = \dfrac{m^2-m-2}{(x-1+m)^2} \le 0 \to m^2-m-2 \le 0 \to -1 \le m \le 2$

$1-m \le 1 \to 0 \le m \Rightarrow 0 \le m \le 2 \to \boxed{m=1} , \boxed{m=0}$

(10)