Subject: یوسف عربیان — تکلیف ۱۹ — ۱۷/۵

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$$\lim_{x\to -2^+} 2\left[\frac{2-x}{2}\right]+a\left[\frac{x+2}{3}\right]=\lim_{x\to -2^-} 2\left[\frac{2-x}{2}\right]+a\left[\frac{x+2}{3}\right]$$

پایین صفحه $2\times 1+a\times 0=4\times 2-a \Rightarrow a=6 \Rightarrow \left[\frac{a}{3}\right]=2$ ۵

سؤال ۲)

$$x<\frac{\pi}{6} \Rightarrow \sin x<\frac{1}{2} \Rightarrow 2\sin x-1<0$$

$$\Rightarrow \lim_{x\to \frac{\pi}{6}^-}[2\sin x-1]=-1$$ ۲

سؤال ۳)

$$\lim_{x\to -\frac{1}{2}}[8x^3-x]$$

$x=-\frac{1}{2} \Rightarrow 8x^3-x=8\times\frac{-1}{8}+\frac{1}{2}=-\frac{1}{2}$ چون صحیح نیست

$$\Rightarrow \lim_{x\to -\frac{1}{2}}[8x^3-x]=\lim\left[-\frac{1}{2}\right]=-1$$ ۲

سؤال ۴)

$$x<-\frac{1}{2} \Rightarrow -x>\frac{1}{2} \Rightarrow x^2>\frac{1}{4} \Rightarrow \frac{1}{x^2}<4$$

$$\Rightarrow \frac{3}{x^2}<12$$

$$\Rightarrow \frac{-2}{x^2}>-8$$

$$\lim_{x\to -\frac{1}{2}^-}\frac{10x+\left[\frac{3}{x^2}\right]}{16x-\left[-\frac{2}{x^2}\right]}=\lim_{x\to -\frac{1}{2}^-}\frac{10x+11}{16x+8}=\frac{1}{0^-}=-\infty$$ ۲

سؤال ۵)

$$\lim_{x\to 1^+}\frac{\sin^2\pi x}{[x]+\cos\pi x}=\lim_{x\to 1^+}\frac{\sin^2\pi x}{1+\cos\pi x}=\frac{0}{0}$$

رفع ابهام: $$\lim_{x\to 1^+}\frac{\sin^2\pi x}{1+\cos\pi x}=\lim_{x\to 1^+}\frac{\sin^2(\pi-\pi x)}{1+\cos\pi x}=\lim_{x\to 1^+}\frac{(\pi-\pi x)^2}{1+\cos\pi x}$$

$$\overset{HOP}{=}\lim_{x\to 1^+}\frac{-2\pi(\pi-\pi x)}{-\pi\sin\pi x}\overset{HOP}{=}\lim_{x\to 1^+}\frac{+2\pi x}{-\pi\cos\pi x}=\frac{2\pi}{\pi}=2$$

Arman

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سوال ۶)

$$\lim_{x\to -1} \frac{\sqrt{2x+3}-\sqrt{3x+4}}{1+\sqrt[3]{x}} \times \frac{\sqrt{2x+3}+\sqrt{3x+4}}{\sqrt{2x+3}+\sqrt{3x+4}} \times \frac{\sqrt[3]{x^2}-\sqrt[3]{x}+1}{\sqrt[3]{x^2}-\sqrt[3]{x}+1}$$

$$= \frac{-x-1}{x+1} \times \frac{3}{2} = \cancel{0} \rightarrow \lim_{x\to -1} \frac{-(x+1)}{x+1} \times \frac{3}{2} = \boxed{-\frac{3}{2}}$$

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سوال ۷)

$$\lim_{x\to 1} \frac{2x-7\sqrt{x}+5}{2x-\sqrt{3x+1}} \overset{Hop}{=} \lim_{x\to 1} \frac{2-\frac{7}{2\sqrt{x}}}{2-\frac{3}{2\sqrt{3x+1}}} = -\frac{6}{5}$$

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سوال ۸)

مخرج $=0 \Rightarrow$ صورت $=0 \Rightarrow a+\sqrt{c}=0 \Rightarrow a=-\sqrt{c}$

$$\lim_{x\to 0} \frac{a+\sqrt{bx+c}}{x} \overset{Hop}{=} \lim_{x\to 0} \frac{\frac{b}{2\sqrt{bx+c}}}{1} = \frac{b}{2\sqrt{c}} = \frac{1}{4} \Rightarrow b = \frac{\sqrt{c}}{2}$$

$$\Rightarrow \frac{ab}{c} = \frac{\frac{\sqrt{c}}{2} \times -\sqrt{c}}{c} = -\frac{1}{2}$$

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سوال ۹)

$$\lim_{x\to -2\pi^+} \frac{4+K[\frac{x}{\pi}]}{\sin x} = \frac{4-2K}{0^+} = +\infty \Rightarrow 4-2K>0$$

$$\lim_{x\to -2\pi^-} \frac{4+4[\frac{x}{\pi}]}{\sin x} = \frac{4-3K}{0^-} = +\infty \Rightarrow 4-3K<0$$

$$\Rightarrow \frac{4}{3} < K < 2 \Rightarrow -\frac{4}{3} > -K > -2$$

$$\Rightarrow [-K] = -2$$

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سوال ۱۰)

صورت $=0 \Rightarrow$ مخرج $=0 \Rightarrow 8a-b=0 \Rightarrow 8a=b$

$$\lim_{x\to 8} \frac{b\sqrt{2+\sqrt[3]{x}}-2b}{ax-b} \overset{Hop}{=} \frac{b\,\frac{\frac{1}{3\sqrt[3]{x^2}}}{2\sqrt{2+\sqrt[3]{x}}}}{a} = \frac{b}{a} \times \frac{1}{48} = \frac{8a}{a} \times \frac{1}{48}$$

$$= \frac{1}{6}$$

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Arman

سوال ۱

$$\lim_{x\to(-2)^+} f(x) = \lim_{x\to(-2)^-} f(x)$$

$$\lim_{x\to(-2)^+} f(x) = 2\left[1-\frac{(-2)^+}{2}\right] + a\left[\frac{2+(-2)^+}{3}\right] \longrightarrow 2\left[1-(-1)^+\right] + a\left[\frac{0^+}{3}\right] = 2$$

$$\lim_{x\to(-2)^-} f(x) = 2\left[1-\frac{(-2)^-}{2}\right] + a\left[\frac{2+(-2)^-}{3}\right] \longrightarrow 2\left[2^+\right] + a\left[\frac{0^-}{3}\right] = 4-a$$

$$4-a=2 \longrightarrow a=2 \longrightarrow \left[\frac{a}{3}\right] = \left[\frac{2}{3}\right] = 0$$