A دوازدهم — تکلیف ۱۹ — سارینا رضوی — ۱۹٫۵

۱)
$$f(x)=2\left[\frac{2-x}{2}\right]+a\left[\frac{x+2}{3}\right]$$
$\xrightarrow{-2^+} 2+a(0)=2 \qquad \left[\frac{0}{3}\right]=0$ ✓

$\xrightarrow{-2^-} 4-a=2 \longrightarrow a=2$ ✓

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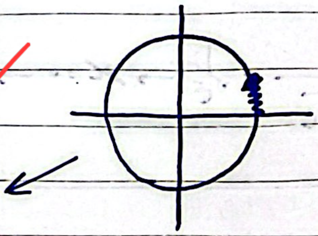
۲)
$$\lim_{x\to \frac{\pi}{6}^-}\left[2\sin x-1\right] \longrightarrow \lim_{x\to\frac{\pi}{6}^-}\left[0^-\right]=-1$$ ✓



$2\sin x-1<0 \longrightarrow 2\sin x<1 \longrightarrow \sin x<\frac{1}{2}$

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۳)
$$\lim_{x\to-\frac{1}{2}}\left[8x^3-x\right] \xrightarrow{\text{مشتق}} 24x^2-1 \xrightarrow{x=-\frac{1}{2}} y'=5 \rightsquigarrow \oplus \text{ شیب}$$

$$\longrightarrow \lim_{x\to-\frac{1}{2}} f(x)=-1$$ ✓

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۴)
$$\lim_{x\to-\frac{1}{2}^-}\frac{10x-5+\left[\frac{3}{x^2}\right]}{16x-\left[\frac{-2}{x^2}\right]}$$

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

$\lim_{x\to(-\frac{1}{2})^-} = \frac{10x+6}{16x-(-8)} = \lim \frac{10x+6}{16x+8} = \frac{1}{0^-}$

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

$\longrightarrow \lim_{x\to-\frac{1}{2}}\frac{10x+6}{16x-8} = -\frac{1}{16} = -\infty$

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

۱٫۵

۵)
$$\lim_{x\to1^+}\frac{\sin^2\pi x}{1+\cos\pi x} \longrightarrow \lim_{x\to1^+}\frac{1-\cos^2\pi x}{1+\cos\pi x} \longrightarrow \frac{\cancel{(1+\cos\pi x)}(1-\cos\pi x)}{\cancel{1+\cos\pi x}}$$

$$\longrightarrow \lim_{x\to1^+} 1-\cos\pi x = 2$$ ✓

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۶)
$$\lim_{x\to-1}\frac{\sqrt{2x+3}-\sqrt{3x+4}}{1+\sqrt[3]{x}} \xrightarrow{\text{Hop}} \frac{\frac{2}{2\sqrt{2x+3}}-\frac{3}{2\sqrt{3x+4}}}{\frac{1}{3\sqrt[3]{x^2}}} = \frac{1-\frac{3}{2}}{\frac{1}{3}} = -\frac{3}{2}$$ ✓

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(7

$$\lim_{x\to 1}\frac{2x-7\sqrt{x}+5}{2x-\sqrt{3x+1}} \xrightarrow{HOP} \lim \frac{2-\frac{7}{2\sqrt{x}}}{2-\frac{3}{2\sqrt{3x+1}}} = \frac{-\frac{3}{2}}{\frac{5}{4}} = -\frac{6}{5}$$

(8

$$\lim_{x\to 0}\frac{a+\sqrt{bx+c}}{x}=\frac{1}{4} \longrightarrow a+\sqrt{c}=0$$

$$\sqrt{c}=-a \longrightarrow a<0$$

$$\xrightarrow{hop} \frac{b}{2\sqrt{bx+c}}=\frac{1}{4} \to x=0 \to \frac{b}{2\sqrt{c}}=\frac{1}{4} \to \frac{b}{\sqrt{c}}=\frac{1}{2} \to 2b=\sqrt{c}$$

$$\Big\} \to \frac{-\sqrt{c}\times\sqrt{c}}{2c} = -\frac{1}{2}$$

(9

$$\lim_{x\to -2\pi}\frac{4+k\left[\frac{x}{\pi}\right]}{\sin x}=+\infty$$

$$\xrightarrow{-2\pi^+} -2\pi<x \to \frac{x}{\pi}>-2 \to \frac{4-2k}{0^+} \qquad 4-2k>0 \qquad \boxed{k<2}\ \mathrm{I}$$

$$\xrightarrow{-2\pi^-} -2\pi>x \to \frac{x}{\pi}<-2 \to \frac{4-3k}{0^-} \qquad 4-3k<0 \qquad \boxed{k>\frac{4}{3}}\ \mathrm{II}$$

$$\mathrm{II}\cap\mathrm{I} \to \frac{4}{3}<k<2 \longrightarrow -\frac{4}{3}>-k>-2$$

$$[-k]=-2$$

(10

$$\lim_{x\to 8}\frac{b\sqrt{2+\sqrt[3]{x}}-2b}{ax-b} \longrightarrow \lim \frac{b\left(\sqrt{2+\sqrt[3]{x}}-2\right)}{b\left(\frac{x}{8}-1\right)}$$

$$8a-b=0 \to a=\frac{b}{8}$$

$$\times\frac{\sqrt{2+\sqrt[3]{x}}+2}{\underbrace{\sqrt{2+\sqrt[3]{x}}+2}_{4}} = \frac{\cancel{2}+\sqrt[3]{x}-\cancel{4}}{\frac{x}{2}-4}\times\frac{\sqrt[3]{x^2}+4+2\sqrt[3]{x}}{\underbrace{\sqrt[3]{x^2}+4+2\sqrt[3]{x}}_{12}} = \frac{x-8}{6(x-8)} = \frac{1}{6}$$