نورسین زندی :

-۱

$$f(x)=2\left[\frac{2-x}{2}\right]+a\left[\frac{x+2}{3}\right] \quad x\to -2$$

$$x\to -2^+ : \quad 2\left[\cancel{\frac{2-(-2)^+}{2}}\right]+a\left[\cancel{\frac{(-2)^+ +2}{3}}\right]=2 \qquad (1,\ 0)$$

$$x\to (-2)^- : \quad \underbrace{2\left[\cancel{\frac{2-(-2)^-}{2}}\right]}_{4}+a\left[\cancel{\frac{(-2)^- +2}{3}}\right]=4-a \qquad (2,\ -1)$$

$$\left[\frac{a}{3}\right]=?$$

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

سؤال ۲

$$\lim_{x\to(\frac{\pi}{4})^-}\left[2\sin x-1\right]=\left[\cancel{2}\times\left(\frac{1}{\cancel{2}}\right)^- -1\right]=\left[1^- -1\right]=\boxed{-1}$$

سؤال ۳

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

سؤال ۴

$$\lim_{x\to(-\frac{1}{2})^-}\frac{10x-5+\left[\frac{3}{x^2}\right]}{16x-\left[-\frac{2}{x^3}\right]}=\lim\frac{10x-5+\left[\frac{3}{(-\frac{1}{2})^{-2}}\right]}{}=\frac{10x-5+\left[12^-\right]}{16x-\left[-\cancel{\frac{2}{(-\frac{1}{2}^-)^3}}\right]}$$

$$\left[-8^+\right]=-8$$

$$=\lim\frac{10x-5+12}{16x+8}$$

$$=\frac{-5-5+11}{0^-}=\frac{1}{0^-}=-\infty$$

سؤال ۵

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

$$\lim_{x\to 1^+}\frac{1-\cos^2\pi x}{1+\cos\pi x}=\lim\frac{\cancel{(1+\cos\pi x)}(1-\cos\pi x)}{\cancel{(1+\cos\pi x)}}=\lim_{x\to 1^+}(1-\cos\pi x)=1-(-1)=\boxed{2}$$

سؤال ۶

$$\lim_{x\to -1}\frac{\sqrt{2x+3}-\sqrt{3x+4}}{1+\sqrt[3]{x}}=\frac{0}{0} \quad \text{رفع ابهام} \Rightarrow \text{hopital}$$

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

سؤال ۷

$$\lim_{x\to 1} \frac{2x - 7\sqrt{x} + 5}{2x - \sqrt{3x+1}} = \frac{0}{0} \rightsquigarrow \text{رفع ابهام}$$

$$\Rightarrow \text{hopital} \quad \lim_{x\to 1} \frac{2 - \frac{7}{2\sqrt{x}}}{2 - \frac{3}{2\sqrt{3x+1}}} = \frac{2-\frac{7}{2}}{2-\frac{3}{4}} = \frac{-\frac{3}{2}}{\frac{5}{4}} = \frac{-12}{10} = \boxed{-1/2}$$

سؤال ۸

$$\lim_{x\to 0} \frac{a+\sqrt{bx+c}}{x} = \frac{1}{4} \rightsquigarrow \frac{a+\sqrt{b\cdot 0+c}}{0} = \frac{a+\sqrt{c}}{0} = \frac{0}{0} \Rightarrow a+\sqrt{c}=0 \rightsquigarrow a=-\sqrt{c}$$

$$\frac{ab}{c} = ?$$

$$\Rightarrow \text{رفع ابهام} \longrightarrow \text{hopital} \lim \frac{\frac{b}{2\sqrt{bx+c}}}{1} = \frac{1}{4} \Rightarrow 2b = \sqrt{c}$$

$$\Rightarrow \frac{ab}{c} = \frac{-\sqrt{c} + \frac{\sqrt{c}}{2}}{c} = \frac{-\frac{\cancel{c}}{2}}{\cancel{c}} = \boxed{-\frac{1}{2}}$$

سؤال ۹

$$\lim_{x\to -2\pi} \frac{4 + k\left[\frac{x}{\pi}\right]}{\sin x} = +\infty \Rightarrow \lim \frac{4 + k\left[\frac{-2\cancel{\pi}}{\cancel{\pi}}\right]}{0} = \frac{4+k(-2)}{0}$$

$$\Rightarrow \frac{4-2k}{0^+} = +\infty \Rightarrow 4-2k \geq 0 \Rightarrow k \geq 2 \rightsquigarrow k = 2^+$$

$$[-k] = ?$$

$$\Rightarrow [-2^+] = \boxed{-2}$$

سؤال ۱۰

$$\lim_{x\to 8} \frac{b\sqrt{2+\sqrt[3]{x}} - 2b}{ax-b} = \frac{b\sqrt{2+2} - 2b}{8a-b} = \frac{0}{8a-b} = \frac{0}{0}$$

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

$$\Rightarrow \text{رفع ابهام} \rightsquigarrow \text{hopital} \quad \lim \frac{\frac{b\frac{1}{3\sqrt[3]{x^2}}}{2\sqrt{2+\sqrt[3]{x}}}}{a} \rightsquigarrow \frac{b\times\frac{1}{12}}{\frac{4}{a}} = \boxed{\frac{1}{9}}$$