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ـ1

$x\to 2^+ \rightsquigarrow 2[2^-]+a[0^+]=1$

$x\to 2^- \rightsquigarrow 2[2^+]+a[0^-]=4-a$

$\Rightarrow 2=4-a\to \cancel{a=1}\; a=2$

$\rightsquigarrow [\frac{a}{3}]=[\frac{\cancel{1}\,2}{3}]=\cancel{\boxed{1}}\to 0$

(1)

ـ2

$\lim [2\sin x]-1=[1^-]-1=\boxed{-1}$

$x\to(\frac{\pi}{4})^-$

(2)

ـ3

$\lim [8x^3-x]=[x(8x^2-1)]$

$x\to -\frac12 \qquad 0 \qquad x=\pm\frac{1}{2\sqrt2}=\pm\frac{\sqrt2}{4}$

$-\frac{\sqrt2}{4} \qquad 0 \qquad \frac{\sqrt2}{4}$

$-1 \quad + \quad - \quad +$

$\to [0^-]=\boxed{-1}$ $\qquad [0^+]=\cancel{0}$

(2)

ـ4

$\lim \dfrac{10x-5+[\frac{3}{x^3}]}{14x-[-\frac{2}{x^2}]}=\dfrac{-5-5+[12^+]}{-8-[-8^-]}$ $\quad -9$

$x\to(-\frac12)^-$

$=\frac{2}{1}=\boxed{2}$

(5)

ـ5

$\lim \dfrac{\sin^2\pi x}{[x]+\cos\pi x}=\dfrac{\sin^2\pi x}{1+\cos\pi x}$

$x\to 1^+$

$=\dfrac{1-\cos^2\pi x}{1+\cos\pi x}=\dfrac{(1-\cos\pi x)(1+\cos\pi x)}{1+\cos\pi x}$

$=1-\cos\pi x=1-(-1)=\boxed{2}$

(2)

ـ6

$\lim \dfrac{\sqrt{2x+3}-\sqrt{3x+4}}{1+\sqrt[3]{x}}$

$x\to -1$

$\text{Hop}=\dfrac{\frac{1}{\sqrt{2x+3}}-\frac{3}{2\sqrt{3x+4}}}{\frac13(\sqrt[3]{(\frac1x)^2})}=\dfrac{1-\frac32}{\frac13}=\dfrac{-\frac12}{\frac13}$

$=-\frac32=\boxed{-1.5}$

(2)

ـ7

$\lim \dfrac{2x-7\sqrt{x}+5}{2x-\sqrt{3x+1}}$

$x\to 1$

$\text{Hop}=\dfrac{2-\frac{7}{2\sqrt x}}{2-\frac{3}{2\sqrt{3x+1}}}=\dfrac{2-\frac72}{2-\frac34}=\dfrac{-\frac32}{\frac54}=$

$-\frac65=\boxed{-1.2}$

(2)

ـ8

$\lim \dfrac{a+\sqrt{bx+c}}{x}=\frac14$

$x\to 0$

$\to a+\sqrt c=0\to a=-\sqrt c$

$\text{Hop}=\dfrac{b}{2\sqrt{bx+c}}=\frac14 \rightsquigarrow \dfrac{b}{2\sqrt c}=\frac14$

$x\to 0 \qquad \Rightarrow 4b=2\sqrt c\to b=\frac{\sqrt c}{2}$

$\rightsquigarrow \dfrac{ab}{c}=\dfrac{(-\sqrt c)(\frac{\sqrt c}{2})}{c}=\dfrac{-c}{2c}=\boxed{-\frac12}$

(2)

ـ9

$\lim \dfrac{4+k[\frac{x}{\pi}]}{\sin x}=+\infty$

$x\to -2\pi$

$\to -2\pi^+ \rightsquigarrow \dfrac{4+k[-2^+]}{0^-}=\dfrac{4-2k}{0^-}$

$\to -2\pi^- \rightsquigarrow \dfrac{4+k[-2^-]}{0^+}=\dfrac{4-3k}{0^+}$

$2k-4=4-3k\to 5k=8\to k=\frac85=1.6$

$\to[-k]=[-1.6]=\boxed{-2}$

(2)

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

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

$$Hop=\lim_{x\to 8}\frac{\frac{\frac{b}{3\sqrt[3]{x^2}}}{2\sqrt{2+\sqrt[3]{x}}}}{a}=\frac{b}{48a}\to\frac{8a}{48a}=\boxed{1/6}$$

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سوال ۴

$$x\to\left(-\tfrac{1}{2}\right)^- \longrightarrow x<-\frac{1}{2}\to x^2>\frac{1}{4}\to\frac{1}{x^2}<4\to\frac{3}{x^2}<12\to\left[\frac{3}{x^2}\right]=11$$

$$\frac{1}{x^2}<4\to-\frac{1}{x^2}>-4\longrightarrow\frac{-2}{x^2}>-8\to\left[\frac{-2}{x^2}\right]=-8$$

$$\leadsto \lim_{x\to(-\frac{1}{2})^-}=\frac{10x-5+11}{16x-(-8)}=\lim_{x\to(-\frac{1}{2})^-}=\frac{10x+6}{16x+8}=\frac{-5+6}{(-8)^-+8}=\frac{1}{0^-}=-\infty$$