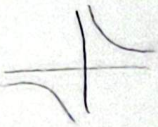
حسابان ۱۲ - دختر A

۱۸٫۷۵

①

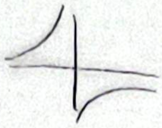
$f(x) = 2\left[\frac{2-x}{2}\right] + a\left[\frac{x+2}{3}\right] \xrightarrow{x\to 2^+} = 2[2^+] + a[0^-] = 4 - a$

$\frac{-x+2}{5x+2}$ = نزولی



با

$\frac{x+3}{5x+3}$



$\xrightarrow{x\to 2^-} = 2[2^-] + a[0^+] = 2$

$4 - a = 2 \quad \boxed{a = 2}$

$\left[\frac{2}{3}\right] = 0$

۲

②

$\lim_{x\to(\frac{\pi}{4})^-} [\underbrace{2\sin x}_{\frac{1}{2}} - 1] \xrightarrow{x=\frac{\pi}{4}} [0] \to$  $\frac{\pi}{4} \xrightarrow[\text{کوچکتر شد}]{\sin} [0^-] = -1$

۲

③

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

۲

④

$\lim_{x\to(-\frac{1}{2})^-} \frac{10x - 5 + \left[\frac{3}{x^2}\right]}{16x - \left[\frac{-2}{x^2}\right]} \xrightarrow{x=-\frac{1}{2}} \frac{-5-5+[12]}{-8-[-8]} \xrightarrow{(-\frac{1}{2})^-} \frac{-5-5+11}{(-8]-(-8)} = \frac{1}{0^-} = -\infty$

حد تعریف نشده

$\frac{3}{x^2} \to \begin{matrix} x=1 & x=2 \\ y=3 & y=\frac{3}{4} \end{matrix} \to$ نزولی $\xrightarrow{(-\frac{1}{2})^-} [12^-]$

$\frac{-2}{x^2} \to \begin{matrix} x=1 & x=2 \\ y=-2 & y=-\frac{1}{2} \end{matrix} \to$ صعودی $\xrightarrow{(-\frac{1}{2})^-} [-8^+]$

۱٫۷۵

⑤

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

$\to \frac{(1-\cos\pi x)(1+\cancel{\cos\pi x})}{\cancel{1+\cos\pi x}} = 1 - \cos \pi x \xrightarrow{x=1} 1-(-1) = 2$

۲

⑥

$\lim_{x\to -1} \frac{\sqrt{2x+3} - \sqrt{3x+4}}{1+\sqrt[3]{x}} \xrightarrow{x=-1} \frac{1-1}{1-1} = \frac{0}{0}$ مبهم

$\frac{\sqrt{2x+3} - \sqrt{3x+4}}{1+\sqrt[3]{x}} \times \frac{\sqrt{2x+3} + \sqrt{3x+4}}{\sqrt{2x+3} + \sqrt{3x+4}} \times \frac{1+\sqrt[3]{x^2}-\sqrt[3]{x}}{1+\sqrt[3]{x^2}-\sqrt[3]{x}} = \frac{(\overbrace{2x+3-3x-4}^{-x-1 \to -(x+1)})(3)}{(\cancel{1+x})(2)}$

$\to -\frac{3}{2}$

۴

⑦

$$\lim_{x\to 1}\frac{2x-7\sqrt{x}+5}{2x-\sqrt{3x+1}}\xrightarrow{x=1}\frac{2-2}{2-2}=\frac{0}{0}$$ مبهم

$$\frac{2x+5-7\sqrt{x}}{2x-\sqrt{3x+1}}\times\frac{(2x+5)+(7\sqrt{x})}{(2x+5)+(7\sqrt{x})}\times\frac{2x+\sqrt{3x+1}}{2x+\sqrt{3x+1}}=\frac{(4x^2+25+20x-49x)(4)}{(4x^2-3x-1)(14)}$$

$$\frac{(4x^2-29x+25)4}{(4x^2-3x-1)(14)}\to\frac{\cancel{(x-1)}(4x-25)(4)}{\cancel{(x-1)}(4x+1)(14)}=\frac{\overset{-3}{\cancel{-21}}\times\overset{2}{\cancel{4}}}{5\times\underset{7}{\cancel{14}}}=\frac{-6}{5}$$

2

---

⑧

$$\lim_{x\to 0}\frac{a+\sqrt{bx+c}}{x}=\frac{1}{4}\xrightarrow[\text{صورت} = 0]{\frac{0}{0}\ \text{مبهم بوده}}①\ a+\sqrt{c}=0\to a=-2b$$

$$② \text{ Hop}\to\frac{b}{2\sqrt{bx+c}}\xrightarrow{x=0}\frac{b}{2\sqrt{c}}=\frac{1}{4}\qquad 2\sqrt{c}=4b\quad \sqrt{c}=2b\quad c=4b^2$$

2

$$\frac{ab}{c}\to\frac{-2b\times b}{4b^2}=\frac{-2b^2}{4b^2}=-\frac{1}{2}$$

---

⑨

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

$$\nearrow -2\pi^+=+\infty\to\frac{4+k[-\bar{2}]}{0^+}\to 4-3k>0\quad k<\frac{4}{3}$$

$$\searrow -2\pi^-=+\infty$$

یا $$\frac{4+k[-2^+]}{0^-}\to 4-2k<0\quad k>2$$

1

$$\to\quad \frac{4}{3}\qquad 2$$?

پایین صفحه

---

⑩

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

2

$$\frac{b\sqrt{2+\sqrt[3]{x}}-2b}{ax-b}\times\frac{b\sqrt{2+\sqrt[3]{x}}+2b}{b\sqrt{2+\sqrt[3]{x}}+2b}=\frac{b^2(2+\sqrt[3]{x})-4b^2}{(ax-b)(4b)}=\frac{b^2(\sqrt[3]{x}-2)}{4b(ax-b)}$$

$$\frac{b^2(\sqrt[3]{x}-2)}{4b(ax-b)}\times\frac{\sqrt[3]{x^2}+4+2\sqrt[3]{x}}{〃}=\frac{(x-8)b^2b}{(ax-b)4b(12)}$$

$$\curvearrowright ax-b=x-8\to\frac{b}{4\times 12}=\frac{8}{4\times 12}=\boxed{\frac{1}{6}}$$

$$a=1\quad b=8$$

سوال ۹

$$\lim_{x\to(-2\pi)^-} = \frac{4+K\left[\frac{x}{\pi}\right]}{\sin x} = \frac{4-3K}{0^-} = +\infty \longrightarrow 4-3K<0 \longrightarrow K>\frac{4}{3} \quad (I)$$

$$\lim_{x\to(-2\pi)^+} = \frac{4+K\left[\frac{x}{\pi}\right]}{\sin x} = \frac{4-2K}{0^+} = +\infty \longrightarrow 4-2K>0 \longrightarrow K<2 \quad (II)$$

$$\xrightarrow{(I)\cap(II)} \frac{4}{3}<K<2 \longrightarrow -2<-K<-\frac{4}{3} \longrightarrow [-K] = -2$$