۹/۱۰: دوازدهم ریاضی A هانیه نوروزیان تکلیف شماره ۱۹

(۱

$$f(x) = 2\left[\frac{2-x}{2}\right] + a\left[\frac{x+2}{3}\right] \Rightarrow x=-2 \text{ در } \Rightarrow$$

حد دارد

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

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

$$2 - a = 4 \Rightarrow a = -2 \Rightarrow \left[\frac{-2}{3}\right] = -1$$

پایین صفحه

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$$\lim_{x \to (\frac{\pi}{4})^-} [2\sin x - 1] \Rightarrow \lim [2\underbrace{\sin(\tfrac{\pi}{4})^-}_{(\frac{1}{2})^-} - 1] =$$

$$[1^- - 1] = [0^-] = -1$$

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(۳ چون در براکت عدد صحیح می شود نیازی به دو طرفه گرفتن نیست ⇐

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

14)

$$\lim_{x\to(-\frac{1}{2})^-} \frac{10x - 5 + [\frac{3}{x^2}]}{16x - [-\frac{2}{x^2}]} \Rightarrow \frac{-5-5+\underbrace{[\cancel{12}]}_{11}}{-8-\underbrace{[-\cancel{\frac{2}{(\frac{1}{4}^-)}}]}_{-9}} = \frac{1}{1}$$

$$= 1$$

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15)

$$\lim_{x\to 1^+} \frac{\sin^2 \pi x^+}{1+\cos \pi x^+} = \frac{0}{0^+} \Rightarrow \text{رفع ابهام} \Rightarrow \frac{\sin^2\pi}{1+\cos\pi} \times \frac{1-\cos\pi}{1-\cos\pi}$$

2

$$\Rightarrow \frac{\cancel{\sin^2\pi}(1-\cos\pi)}{\cancel{\sin^2\pi}} = 1-\cos\pi \Rightarrow 1-(-1) = 2$$

16)

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

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

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

17)

0

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

سوال ۱

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

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

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

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

سوال ۴

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

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

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

سوال ۷

$$\lim_{x\to1}\frac{(\sqrt{x}-1)(2\sqrt{x}-5)}{2x-\sqrt{3x+1}} = \frac{(\sqrt{x}-1)(2\sqrt{x}-5)}{2x-\sqrt{3x+1}}\times\frac{2x+\sqrt{3x+1}}{2x+\sqrt{3x+1}} \longrightarrow$$

$$\lim_{x\to1}\frac{(\sqrt{x}-1)(2\sqrt{x}-5)\times(2x+\sqrt{3x+1})}{4x^2-3x-1} = \lim_{x\to1}\frac{\cancel{(\sqrt{x}-1)}(2\sqrt{x}-5)(4)}{(4x+1)\underbrace{(x-1)}_{\cancel{(\sqrt{x}-1)}(\sqrt{x}+1)}} =$$

$$\lim_{x\to1}\frac{(2\sqrt{x}-5)(4)}{(4x+1)(\sqrt{x}+1)} = \frac{(-3)(4)}{5\times2} = -1.2$$

سوال ۸

$$\lim_{x\to 0} a+\sqrt{bx+c} \to a+\sqrt{c}=0 \to a=-\sqrt{c}$$

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

$$\frac{b}{2\sqrt{c}}=\frac{1}{4}\to b=\frac{\sqrt{c}}{2}\to\frac{ab}{c}=\frac{(-\sqrt{c})(\frac{\sqrt{c}}{2})}{c}=\frac{-c}{2c}=-\frac{1}{2}$$

سوال ۹

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

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

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

سوال ۱۰

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

$$\lim_{x\to 8}\frac{8a(\sqrt{2+\sqrt[3]{x}}-2)}{ax-8a}=\frac{8a(\sqrt{2+\sqrt[3]{x}}-2)}{ax-8a}\times\frac{\sqrt{2+\sqrt[3]{x}}+2}{\sqrt{2+\sqrt[3]{x}}+2}=$$

$$\lim_{x\to 8}\frac{8a(\sqrt[3]{x}-2)}{a(x-8)\times 4}\to\lim_{x\to 8}\frac{2(\sqrt[3]{x}-2)}{(\sqrt[3]{x}-2)(\sqrt[3]{x^2}+4+2\sqrt[3]{x})}=\frac{2}{12}=\frac{1}{6}$$