نیکو حیدری . بسم الله الرحمن الرحیم . تکلیف (۱۹)

سوال ۱

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

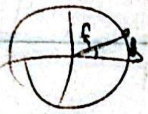
$x \to -2^{+}$; $-1.8 \Rightarrow 2 + 0 = 2$

$x \to -2^{-} \to -2.1 \Rightarrow 4 - a =$

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

سوال ۲

$$\lim_{x \to (\frac{\pi}{6})^{-}} [2\sin x - 1] \qquad \lim_{x \to \frac{\pi}{6}^{-}} [2(\tfrac{1}{2}^{-}) - 1] = [1^{-} - 1] = [0^{-}]$$



$$= -1$$

سوال ۳

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

$$\lim_{x \to \frac{1}{2}} [-\tfrac{1}{2}] \xrightarrow[\text{حاصل براکت عدد صحیح نشده بنابراین نیاز به دو طرفه کردن نیست}]{} \boxed{-1}$$

سوال ۴

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

$x < -\frac{1}{2}$	$x < -\frac{1}{2}$
$x^2 > \frac{1}{4}$	$x^2 > \frac{1}{4}$
$\frac{1}{x^2} < 4$	$\frac{1}{x^2} < 4$
$\frac{3}{x^2} < 12$	$-\frac{2}{x^2} > -8$
$[\frac{3}{x^2}] = 11$	$[-\frac{2}{x^2}] = -8$

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

$$\lim_{x \to -\frac{1}{2}^{-}} \frac{1}{8(2x+1)} = -\infty$$

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سوال ۵

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

$$\lim \frac{\sin^2 \pi x \,.\, (1-\cos \pi x)}{\frac{1-\cos^2 \pi x}{\sin^2 \pi x}} = \lim_{x\to 1^+} 1-\cos \pi x = 2$$

سوال ۶

$$\lim_{x\to -1} \frac{\sqrt{2x+3} - \sqrt{3x+4}}{1+\sqrt[3]{x}} \times \frac{\text{م ص}}{\text{م ص}} \times \frac{\text{ف م}}{\text{ف م}} =$$

$$\frac{2x+3-3x-4}{1+x} \times \frac{3}{2} = \boxed{-\frac{3}{2}}$$

سوال ۷

$$\lim_{x\to 1} \frac{2x - 7\sqrt{x} + 5}{2x - \sqrt{3x+1}} \times \frac{\text{م م}}{\text{م م}} = \frac{2x - 7\sqrt{x}+5}{4x^2-3x-1} \times 2x+\sqrt{3x+1} =$$

$$\frac{(\cancel{\sqrt{x}-1})(2\sqrt{x}-5)}{(x-1)(4x+1)} \qquad \frac{}{(\cancel{\sqrt{x}-1})(\sqrt{x}+1)}$$

$$\frac{-3\times 4}{2\times 5} = -\frac{6}{5}$$

سوال ۸

$$\lim_{x\to 0} \frac{a+\sqrt{bx+c}}{x} \Rightarrow \frac{0}{0} \to a+\sqrt{c} = 0 \to a^2 = c \quad (1)$$

$$\boxed{a^2 = c \; (1)}$$

$$\frac{a+\sqrt{bx+c}}{x} \times \frac{a-\sqrt{bx+c}}{a-\sqrt{bx+c}} = \frac{a^2-bx-c}{x} \times \frac{1}{2a} = \frac{1}{4}$$

$$-\frac{bx}{x} \times \frac{1}{2a} = \frac{1}{4} \Rightarrow -\frac{b}{a} = \frac{1}{2} \to b = -\frac{a}{2} \to -2b = a$$

$$c \to a^2 = 4b^2$$

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

سوال ۹

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

$① \to -2\pi^+ \quad \frac{4+k[-2^+]}{\sin -2\pi^+} = \frac{4-2k}{0^+} = +\infty \to 4-2k>0 \to \boxed{2>k}$

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

$\frac{4}{3}<k<2 \longrightarrow -\frac{4}{3} > -k > -2 \longrightarrow [-k] = -2$

سوال ۱۰

$$\lim_{x\to 8} \frac{b(\sqrt{2+\sqrt[3]{x}}-2)}{ax-b} \xrightarrow[ax-b=0]{\text{صفر}/\text{صفر}} \times\frac{\text{مزدوج}}{\text{مزدوج}} =$$

$$\frac{b(4+\sqrt[3]{x}-\cancel{4})}{ax-b} \times \frac{1}{\text{مزدوج}} \times \frac{\text{چاق}}{\text{چاق}} = \frac{b(x-8)}{ax-b} \times \frac{1}{\sqrt{2+\sqrt[3]{x}}+2} \times \frac{1}{x^2+2x+4}$$

$$\xrightarrow[\substack{a=1 \\ b=8}]{ax-b\equiv x-8} \frac{8}{4\times 12} = \frac{1}{6}$$

خسته نباشید