پویا ملاقلیان — به نام خدا — ۲۰ آفرین ☆

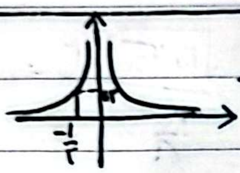
DATE / / SUBJECT:

① $-2^- \to f(x) = 4 - a$; $-2^+ \to f(x) = 2 + 0$ $\to f(-2^-) = f(-2^+) \to 4 - a = 2 \to a = 2 \to [\frac{2}{3}] = \boxed{0}$ ✓ ۲

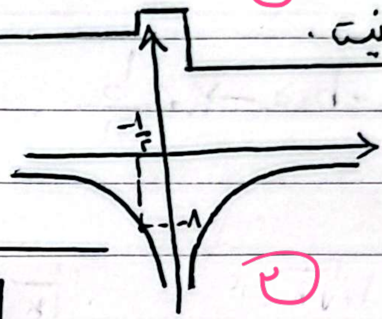
② $\sin\frac{\pi}{6} = \frac{1}{2}^- \to \lim_{x\to\frac{\pi}{6}^-}[2\sin x - 1] = [0^-] = \boxed{-1}$ ✓ ۲

③ $\lim_{x\to -\frac{1}{2}}[8x^3 - x] = [-1 + \frac{1}{2}] = [\frac{-1}{2}] = \boxed{-1}$ باتوجه به صحیح نبودن عبارت داخل براکت نیازی به جداسازی حدها نیست. ۲

④ $y = \frac{3}{x^2}$



$\to \lim_{x\to(\frac{1}{2})^-}[\frac{3}{x^2}] = 11$, $y = -\frac{2}{x^2}$ ✓



$\lim_{x\to(\frac{1}{2})^-}[\frac{-2}{x^2}] = -8 \to \frac{10x - 5 + 11}{16x + 8} = \frac{+1}{0^-} = \boxed{-\infty}$ ✓ ۲

⑤ $\lim_{x\to 1^+}\frac{\sin^2\pi x}{1+\cos\pi x} = \frac{(1-\cos\pi x)(1+\cos\pi x)}{1+\cos\pi x} = 1-\cos\pi x = \boxed{2}$ ✓ ۲

⑥ $\frac{0}{0} \to HOP \to \frac{\frac{2}{2\sqrt{2x+3}} - \frac{3}{2\sqrt{3x+4}}}{\frac{1}{3\sqrt[3]{x^2}}} = \frac{1-\frac{3}{2}}{\frac{1}{3}} = \frac{-\frac{1}{2}}{\frac{1}{3}} = \boxed{\frac{-3}{2}}$ ✓ ۲

⑦ $HOP \to \frac{2 - \frac{7}{2\sqrt{x}}}{2 - \frac{3}{2\sqrt{3x+1}}} = \frac{2-\frac{7}{2}}{2-\frac{3}{4}} = \frac{-\frac{3}{2}}{\frac{5}{4}} = \boxed{\frac{-6}{5}}$ ✓ ۲

⑧ مخرج کسر صفر حد است پس صورت نیز باید صفر باشد تا حاصل حد عدد شود.

~~HOP~~

$a + \sqrt{c} = 0 \to a = -\sqrt{c}$ ۲

$\lim_{x\to 0}\frac{a+\sqrt{bx+c}}{x} = \frac{1}{4} \to \frac{a^2-bx-c}{(x)(2a)} = \frac{-bx}{(x)(2a)} = \frac{-b}{2a} = \frac{1}{4} \to$

$\frac{b}{a} = \frac{-1}{2} \to b = \frac{-a}{2} = \frac{\sqrt{c}}{2} \to \frac{ab}{c} = \frac{-\sqrt{c}\times\frac{\sqrt{c}}{2}}{c} = \boxed{\frac{-1}{2}}$ ✓

پویا فلفلیان

DATE / / SUBJECT:

⑨

$(-\frac{\pi}{2}^+) \to \frac{4-2k}{\sin x} = \frac{4-2k}{0^+} = +\infty \to 4-2k > 0 \to k < 2$

$(-\frac{\pi}{2}^-) \to \frac{4-2k}{\sin x} = \frac{4-2k}{0^-} = +\infty \to 4-2k < 0 \to \frac{4}{3} < k$

$-2 < -k < -\frac{4}{3}$

$\to [-k] = \boxed{-2}$ ✓

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⑩

$\lambda a - b = 0 \to x = \frac{b}{\lambda} \to \lim_{x \to 1} \frac{b(\sqrt{2+\sqrt[3]{x}} - 2)}{b(\frac{x}{\lambda} - 1)} = \lim_{x \to 1} \frac{\sqrt{2+\sqrt[3]{x}} - 2}{\frac{x}{\lambda} - 1} =$

$\lim_{x \to 1} \frac{2+\sqrt[3]{x} - 4}{(\frac{x}{\lambda} - 1)(\sqrt{2+\sqrt[3]{x}} + 2)} = \frac{\sqrt[3]{x} - 2}{(\frac{x}{\lambda} - 1)(4)} \to \frac{0}{0} \to \text{H.O.P} = \frac{\frac{1}{3\sqrt[3]{x^2}}}{\frac{1}{2}} = \frac{\frac{1}{12}}{\frac{1}{2}} = \boxed{\frac{1}{6}}$ ✓