۱۶٫۷۵

نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره 19 کلاس ...

۱

$-2^+: 2\left[\frac{2-(-2^+)}{2}\right] = 2\left[\frac{4^-}{2}\right] = 2[2^-] = 2(1) = 2$

$a\left[\frac{-2^+ + 2}{3}\right] = a\left[\frac{0^+}{3}\right] = 0$

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

$4 - a = 2 \to a = 2$

$-2^-: 2\left[\frac{2-(-2^-)}{2}\right] = 2\left[\frac{4^+}{2}\right] = 2[2^+] = 2(2) = 4$

$a\left[\frac{-2^- + 2}{3}\right] = a\left[\frac{0^-}{3}\right] = -a$

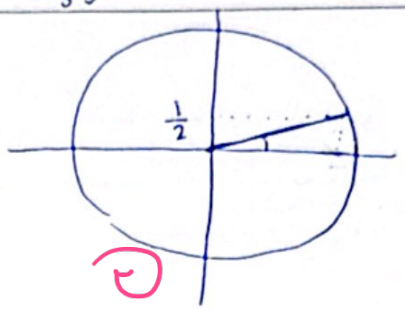
$\lim_{x\to -2^-} f(x) = 4 - a$

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

۲

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

$\left[2(\frac{1}{2}^-) - 1\right] = [1^- - 1] = [0^-] = -1$ ✓



۳

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

۴

$\lim_{x\to(-\frac{1}{2})^-} \frac{10x - 5 + \left[\frac{3}{x^2}\right]}{16x - \left[-\frac{2}{x^2}\right]} = \frac{-5 - 5 + \left[\frac{3}{\frac{1}{4}^+}\right]}{-8^- - \left[-\frac{2}{\frac{1}{4}^+}\right]} = \frac{-10 + [12^-]}{-8^- - [-8^+]} = \frac{1}{0^+} = +\infty$

۱٫۷۵

$x < -\frac{1}{2} \to 16x < -8$

$16x + 8 < 0 \to x \to 0^-$

۵

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

$= 1 - \cos \pi \to 1 - (-1) = 2$ ✓

۶

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

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

۷

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

$$= \frac{(2\sqrt{x}-5)(\sqrt{x}-1)(2x+\sqrt{3x+1})}{(4x-1)(x-1)} = \frac{(2\sqrt{x}-5)(\sqrt{x}-1)(2x+\sqrt{3x+1})}{(4x+1)(\sqrt{x}-1)(\sqrt{x}+1)} \xrightarrow{x=1} \frac{(-3)(4)^2}{(3)(2)(4)} = -2$$

(4x+1 → 4)

۸

$$\lim_{x\to 0} \frac{a+\sqrt{bx+c}}{x} = \frac{1}{4} \longrightarrow$$ چون حد کسر صفر شد پس صورت هم باید صفر بشود : $a+\sqrt{c}=0 \to \sqrt{c}=-a$

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

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

۹

$$(-2\pi)^+ \quad 4+k\left[\frac{(-2\pi)^+}{\pi}\right] = 4+k\left[-2^+\right] = \frac{4-2k}{0^+} \to 4-2k>0 \to 4>2k \to 2>k$$

$$(-2\pi)^- \quad 4+k\left[\frac{(-2\pi)^-}{\pi}\right] = 4+k\left[-2^-\right] = \frac{4-3k}{0^-} \to 4-3k<0 \to 4<3k \to \frac{4}{3}<k$$

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

۱۰

صورت کسر به صفر میل میکند پس چون جواب حد عددی حقیقی است مخرج هم باید به صفر میل کند!

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

$$\lim \frac{8a(\sqrt{2+\sqrt[3]{x}}-2)}{a(x-8)} \times \frac{\sqrt{2+\sqrt[3]{x}}+2}{\sqrt{2+\sqrt[3]{x}}+2} = \lim \frac{8a(\sqrt[3]{x}-2)}{a(x-8)\times 4}$$

$$= \lim \frac{8}{(\sqrt{2+\sqrt[3]{x}}+2)\times 4} = \frac{8}{16\times 4} = \frac{1}{8}$$

7

$$\lim \frac{(\sqrt{x}-1)(2\sqrt{x}-5)}{2x-\sqrt{3x+1}} \times \frac{2x+\sqrt{3x+1}}{2x+\sqrt{3x+1}} = \frac{(\sqrt{x}-1)(2\sqrt{x}-5)\times 4}{4x^2-3x-1}$$

$$\lim \frac{(\sqrt{x}-1)(2\sqrt{x}-5)\times 4}{(\sqrt{x}-1)(4x+1)} = \lim \frac{[2(1)-5]\times 4}{(4(1)+1)\times 2} = -\frac{12}{10}$$

$\sqrt{x}+1$

8

حد مخرج به صفر میل می‌کند چون حاصل حد کلی حقیقی است حد صورت نیز باید به صفر میل کند!

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

$$\lim_{x\to 0} \frac{a+\sqrt{bx+c}}{x} \overset{\text{hop}}{\rightsquigarrow} \lim_{x\to 0} \frac{\frac{b}{2\sqrt{bx+c}}}{1} = \frac{b}{2\sqrt{c}} \rightarrow \frac{b}{2\sqrt{c}} = \frac{1}{4} \rightarrow \boxed{b=\frac{\sqrt{c}}{2}}$$

$$\frac{ab}{c} = \frac{-\sqrt{c}\times\frac{\sqrt{c}}{2}}{c} = -\frac{1}{2}$$