رضا علیجانی

① $\frac{4x^2-7x+3}{5x^2-8x+3} = \frac{(x-1)(4x-3)}{(5x-3)(x-1)} \Rightarrow \lim_{x\to 1} \frac{4x-3}{5x-3} = \frac{1}{2}$

② $\lim_{x\to 0} \frac{|2x-1|-|3x+1|}{x} = \frac{1-2x-3x-1}{x} = \frac{-5x}{x} = -5$

③ $\lim_{x\to 4} \frac{x-4}{\sqrt{x}-2} = \frac{(\sqrt{x}-2)(\sqrt{x}+2)}{\sqrt{x}-2} = \sqrt{x}+2 \xrightarrow{x=4} 4$

④ $\lim_{x\to 2} \frac{x-\sqrt{3x-2}}{3x^2-x-6} \times \frac{x+\sqrt{3x-2}}{x+\sqrt{3x-2}} = \frac{x^2-3x+2}{(x-2)(3x+4)(x+\sqrt{3x-2})} = \frac{x(x-2)}{(x-2)(3x+4)(x+\sqrt{3x-2})}$

$= \frac{x}{(3x+4)(x+\sqrt{3x-2})} \quad x=2 \to \frac{2}{7\times 4} = \frac{1}{14}$

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

$\frac{(1-\sqrt{x})(1+\sqrt{x})(2+\sqrt{5-x})}{(-x-1)(1+\sqrt{x})} \xrightarrow{x=1} 0$

⑥ $\lim_{x\to 2^+} \frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} \times \frac{x+2}{x+2} \times \frac{\text{ف}}{\text{ف}} =$

$\frac{(3x+4-16)(\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7})}{(5x+7-27)(\sqrt{3x+4}+4)} = \frac{3(x-4)(\quad)}{5(x-4)(\quad)}$

$5x \to 20$

$= \frac{3(27)}{5(8)} = \frac{81}{40}$

⑦ $\frac{(1+\cos x)(1-\cos x+\cos^2 x)}{(1-\cos^3 x)} = \frac{(1+\cos x)(1-\cos x+\cos^2 x)}{(1-\cos x)(1+\cos x)}$

$= \frac{1-\cos x+\cos^2 x}{1-\cos x} \quad x=\pi \to \frac{3}{2}$

Arman

Subject:

Year: Month: Day:

(4)

$$\frac{1-\frac{\sin x}{\cos x}}{\sin x-\cos x} = \frac{\frac{\cos x-\sin x}{\cos x}}{\sin x-\cos x} = \frac{-1}{\cos x} \rightarrow \frac{-1}{\frac{\sqrt{2}}{2}} = \frac{-2}{\sqrt{2}}$$

(1.)

$$\frac{\frac{\sin^2 x}{\cos^2 x}-1}{\cos^2 x-\sin^2 x} = \frac{\frac{\sin^2 x-\cos^2 x}{\cos^2 x}}{\cos^2 x-\sin^2 x} = \frac{-1}{\left(\frac{-\sqrt{2}}{2}\right)^2} = -2$$

Arman