

$$\lim_{x \rightarrow 1} \frac{5x^2 - 7x + 3}{5x^2 - 8x + 3} \Rightarrow \frac{5(1)^2 - 7(1) + 3}{5(1)^2 - 8(1) + 3} = \frac{-2+3}{-2+3} = \frac{0}{0} \xrightarrow[\text{اجرام}]{\text{رفع}} \text{قاعده هویتهال}$$

$$\frac{f(x)x^{k-1} - V(1)x^{k-1}}{\omega(x)x^{k-1} - \omega(1)x^{k-1}} = \frac{1x - 7}{10x - 8} = \frac{1-7}{10-8} = \boxed{\frac{-6}{2}}$$

$$\lim_{x \rightarrow 0} \frac{|3x-1| - |3x+1|}{x} \Rightarrow \begin{aligned} \rightarrow 0^+ &= \frac{(1-3x) - (3x+1)}{x} = \frac{-6x}{x} = -6 \\ \rightarrow 0^- &= \frac{(1-3x) - (3x+1)}{x} = -6 \end{aligned}$$

$\Rightarrow$  جواب:  $\boxed{-6}$

$$\lim_{x \rightarrow 4} \frac{x-4}{\sqrt{x}-2} \Rightarrow \frac{4-4}{\sqrt{4}-2} = \frac{0}{0} \xrightarrow[\text{اجرام}]{\text{رفع}} \frac{x-4}{\sqrt{x}-2} \times \frac{\sqrt{x}+2}{\sqrt{x}+2} = \frac{(x-4)(\sqrt{x}+2)}{(x-4)}$$

$$\Rightarrow \sqrt{x}+2 \Rightarrow \lim_{x \rightarrow 4} \sqrt{x}+2 \Rightarrow \sqrt{4}+2 = \boxed{4}$$

$$\lim_{x \rightarrow 4} \frac{x - \sqrt{2x}}{2x^2 - x - 4} \Rightarrow \frac{4 - \sqrt{8}}{2(4)^2 - 4 - 4} = \frac{0}{0} \xrightarrow[\text{اجرام}]{\text{رفع}} \frac{x - \sqrt{2x}}{(2x+3)(x-2)} \times \frac{x + \sqrt{2x}}{x + \sqrt{2x}}$$

$$\Rightarrow \frac{x(x-2)}{(2x+3)(x-2)(x+\sqrt{2x})} = \frac{x}{(2x+3)(x+\sqrt{2x})} = \frac{4}{v(4)4} = \boxed{\frac{1}{4}}$$

$$\lim_{x \rightarrow 1} \frac{1 - \sqrt{x}}{x - \sqrt{5-x}} \Rightarrow \frac{1 - \sqrt{1}}{1 - \sqrt{5-1}} = \frac{0}{0} \xrightarrow[\text{اجرام}]{\text{رفع}} \frac{1 - \sqrt{x}}{x - \sqrt{5-x}} \times \frac{1 + \sqrt{x}}{1 + \sqrt{x}} \times \frac{x + \sqrt{5-x}}{x + \sqrt{5-x}}$$

$$\Rightarrow \frac{(1-x)(x + \sqrt{5-x})}{(1+\sqrt{x})(x-1)} \Rightarrow \frac{-1(x + \sqrt{5-x})}{(1+\sqrt{1})} = \frac{-4}{4} = \boxed{-1}$$

$$\lim_{x \rightarrow 8} \frac{\sqrt[3]{3x+5} - 5}{\sqrt[3]{5x+7} - 3} \Rightarrow \frac{\sqrt[3]{29} - 5}{\sqrt[3]{39} - 3} = \frac{0}{0} \xrightarrow[\text{اجرام}]{\text{رفع}} \frac{\sqrt[3]{3x+5} - 5}{\sqrt[3]{5x+7} - 3} \times \frac{\sqrt[3]{3x+5} + 5}{\sqrt[3]{3x+5} + 5} \times \frac{\text{فیل منفرج}}{\text{فیل منفرج}}$$

$$\Rightarrow \text{واسو: } \frac{3(x-8)}{5(x-8)} \times \frac{\sqrt[3]{(5x+7)^2 + \sqrt[3]{(5x+7)+1}}}{\sqrt[3]{3x+5} + 5} \Rightarrow \text{جاگزای: } x \rightarrow 8: \frac{3}{5} \times \frac{27}{11} = \frac{11}{5}$$

$$\lim_{x \rightarrow 1} \frac{\sqrt[3]{3x+\sqrt{x}} - 2}{\sqrt[3]{x} - 1} \Rightarrow \frac{\sqrt[3]{3+\sqrt{1}} - 2}{\sqrt[3]{1} - 1} = \frac{0}{0} \xrightarrow[\text{اجرام}]{\text{رفع}} \frac{\sqrt[3]{3x+\sqrt{x}} - 2}{\sqrt[3]{x} - 1} \times \frac{\text{مزدوج صورت}}{\text{مزدوج صورت}} \times \frac{\text{فیل منفرج}}{\text{فیل منفرج}}$$

$$\Rightarrow \text{واسو: } \lim \left( \frac{(3\sqrt{x}+5)(\sqrt{x}+1)}{\sqrt[3]{3x+\sqrt{x}} + 2} \right) \times \left( \frac{\sqrt[3]{x^2} + \sqrt[3]{x} + 1}{(\sqrt{x}-1)(\sqrt{x}+1)} \right) \Rightarrow \text{جاگزای: } \frac{5}{2} \times \frac{3}{1} = \frac{15}{2}$$

$$\lim_{x \rightarrow \pi} \frac{1 + \cos^2 x}{\sin^2 x} \Rightarrow \frac{1 + \cos^2(\pi)}{\sin^2(\pi)} = \frac{0}{0} \xrightarrow[\text{اجرام}]{\text{رفع}} \frac{1 + \cos^2 x}{1 - \cos^2 x} \times \frac{\text{مزدوج صورت}}{\text{مزدوج صورت}} \times \frac{\text{فیل صورت}}{\text{فیل صورت}}$$

$$\Rightarrow \lim_{x \rightarrow \pi} \frac{(1 + \cos x)(1 - \cos x) \cos^2 x}{(1 - \cos x)(1 + \cos x)} \Rightarrow \frac{(1 - \cos x) \cos^2 x}{1 - \cos x} \Rightarrow \text{جاگزای: } \frac{1 - (-1) + (-1)^2}{1 - (-1)} = \frac{3}{2}$$

$x \rightarrow \pi \rightarrow 1 + \cos x \rightarrow 0$   
 $x \rightarrow \pi \rightarrow 1 - \cos x \rightarrow 2$

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{1 - \tan x}{\sin x - \cos x} \Rightarrow \frac{1 - \tan \frac{\pi}{2}}{\sin \frac{\pi}{2} - \cos \frac{\pi}{2}} = \frac{0}{0} \xrightarrow[\text{اجرام}]{\text{رفع}} \frac{1 - \frac{\sin x}{\cos x}}{\sin x - \cos x} = \frac{\cos x - \sin x}{\cos x (\sin x - \cos x)}$$

$$\Rightarrow \lim_{x \rightarrow \frac{\pi}{2}} \frac{-1}{\cos x} \Rightarrow \frac{-1}{\frac{\sqrt{2}}{2}} = -\frac{2}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = -\sqrt{2}$$

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{\tan^2 x - 1}{\cos^2 x} \Rightarrow \frac{\tan^2(\frac{\pi}{2}) - 1}{\cos^2(\frac{\pi}{2})} = \frac{0}{0} \xrightarrow[\text{اجرام}]{\text{رفع}} \frac{\sin^2 x - \cos^2 x}{\cos^2 x} \times \frac{\text{فیل صورت}}{\text{فیل صورت}}$$

$$\Rightarrow \lim_{x \rightarrow \frac{\pi}{2}} \frac{-1}{\cos^2 x} \Rightarrow \frac{-1}{(-\frac{\sqrt{2}}{2})^2} = \frac{-1}{\frac{2}{4}} = -2$$