① $\lim_{x\to 1} \frac{4x^2-7x+3}{5x^2-8x+3} = \frac{4-7+3}{5-8+3} = \frac{0}{0} \to \frac{(x-1)(4x-3)}{(x-1)(5x-3)} = \frac{4-3}{5-3} = \frac{1}{2}$

② $\lim_{x\to 0} \frac{|3x-1|-|3x+1|}{x} = \frac{0}{0} = \frac{-(3x-1)-(3x+1)}{x} = \frac{-6x}{x} = -6$

③ $\lim_{x\to 4} \frac{x-4}{\sqrt{x}-2} = \frac{0}{0} = \frac{(\sqrt{x}-2)(\sqrt{x}+2)}{\sqrt{x}-2} = \sqrt{x}+2 = 2+2 = 4$

④ $\lim_{x\to 2} \frac{x-\sqrt{2x}}{2x^2-x-6} = \frac{0}{0} = \frac{x-\sqrt{2x}}{(x-2)(2x+3)} \times \frac{x+\sqrt{2x}}{x+\sqrt{2x}} = \frac{x(x-2)}{x^2-2x(x-2)(2x+3)(x+\sqrt{2x})} = \frac{2}{28} = \frac{1}{14}$

⑤ $\lim_{x\to 1} \frac{1-\sqrt{x}}{2-\sqrt{5-x}} = \frac{0}{0} = \frac{1-\sqrt{x}}{2-\sqrt{5-x}} \times \frac{1+\sqrt{x}}{1+\sqrt{x}} \times \frac{2+\sqrt{5-x}}{2+\sqrt{5-x}} = \frac{(1-x)(2+\sqrt{5-x})}{-(1-x)(1+\sqrt{x})} = \frac{4}{-2} = -2$

⑥ $\lim_{x\to 4} \frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3} \times \frac{\text{مزدوج}}{\text{مزدوج}} \times \frac{\text{مکعب}}{\text{مکعب}} = \frac{3(x-4)(\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9)}{5(x-4)(\sqrt{3x+4}+4)} = \frac{18}{20}$

⑦ $\lim_{x\to 1} \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} \times \frac{\text{مزدوج}}{\text{مزدوج}} \times \frac{\text{مکعب}}{\text{مکعب}} = \frac{(\sqrt{x}-1)(3\sqrt{x}+4)(\sqrt[3]{x^2}+\sqrt[3]{x}+1)}{(3x+\sqrt{x}-4)(\sqrt{3x+\sqrt{x}}+2)} = \frac{21}{8}$

$(\sqrt{x}-1)(\sqrt{x}+1)$

⑧ $\lim_{x\to \pi} \frac{1+\cos^3 x}{\sin^2 x} = \frac{(1+\cos x)(\cos^2 x+1-\cos x)}{(1-\cos^2 x)(1+\cos x)(1-\cos x)} = \frac{1-(-1)+1}{1-(-1)} = \frac{3}{2}$

⑨ $\lim_{x\to \frac{\pi}{4}} \frac{1-\tan x}{\sin x-\cos x} = \frac{0}{0} = \frac{\frac{\cos x-\sin x}{\cos x}}{\sin x-\cos x} = \frac{-1}{(\cos x)(\sin x-\cos x)} = \frac{1}{-\cos x} = \frac{-2}{\sqrt{2}} = -\sqrt{2}$

⑩ $\lim_{x\to \frac{3\pi}{4}} \frac{\tan^2 x-1}{\cos 2x} = \frac{0}{0} = \frac{(\tan x-1)(\tan x+1)}{(\cos x-\sin x)(\cos x+\sin x)} = \frac{-(\sin x+\cos x)(\cos x-\sin x)}{\cos^2 x(\cos x-\sin x)(\cos x+\sin x)}$

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