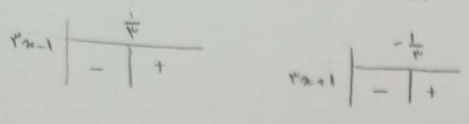


$$\lim_{x \rightarrow 1} \frac{\sqrt{x^2 - 4x + 4}}{2x^2 - 12x + 4} \stackrel{(\frac{0}{0})}{=} \frac{(x-2)(x+2)}{(x-\frac{6}{2})(x+2)} = \frac{x-2}{x-\frac{6}{2}} = \frac{\frac{0}{2}}{\frac{1}{2}} = \frac{1}{1}$$

$$\lim_{x \rightarrow 0} \frac{|3x-1| - |3x+1|}{x} \stackrel{(\frac{0}{0})}{=} \frac{(-1-1) - (3+1)}{x} = \frac{-4x-4}{x} = \frac{-4x}{x} = -4$$



$$\lim_{x \rightarrow 4} \frac{x-4}{\sqrt{x}-4} \stackrel{(\frac{0}{0})}{=} \frac{(\sqrt{x}-4)(\sqrt{x}+4)}{\sqrt{x}-4} = \sqrt{x}+4 = \sqrt{4}+4 = 4+4 = 8$$

$$\lim_{x \rightarrow 1} \frac{x - \sqrt{x}}{x^2 - x - 4} \stackrel{(\frac{0}{0})}{=} \frac{1 - \frac{1}{\sqrt{1}}}{1 - 1 - 4} = \frac{1 - \frac{1}{1}}{1 - 1 - 4} = \frac{1 - 1}{-4} = \frac{0}{-4} = 0$$

$$\lim_{x \rightarrow 1} \frac{1 - \sqrt{x}}{x - \sqrt{x}} \stackrel{(\frac{0}{0})}{=} \frac{1-x}{x-\sqrt{x}} \times \frac{1}{1} = \frac{1-x}{x-\sqrt{x}} \times \frac{1}{1} = \frac{(1-x)}{x-\sqrt{x}} \times \frac{1}{1} = -1$$

$$\lim_{x \rightarrow 4} \frac{\sqrt{3x+5} - 5}{\sqrt{2x+1} - 4} \stackrel{(\frac{0}{0})}{=} \frac{3x+5-25}{2x+1-16} \times \frac{1}{1} = \frac{3x-20}{2x-15} \times \frac{1}{1} = \frac{3(4)-20}{2(4)-15} \times \frac{1}{1} = \frac{12-20}{8-15} \times \frac{1}{1} = \frac{-8}{-7} = \frac{8}{7}$$

$$\lim_{x \rightarrow 1} \frac{\sqrt{3x+5} - 5}{\sqrt{x} - 1} \stackrel{(\frac{0}{0})}{=} \frac{3x+5-25}{x-1} \times \frac{1}{1} = \frac{3x-20}{x-1} \times \frac{1}{1} = \frac{3(1)-20}{1-1} \times \frac{1}{1} = \frac{3-20}{0} \times \frac{1}{1} = \frac{-17}{0} = \infty$$

$$\lim_{x \rightarrow 0} \frac{1 + \cos^2 x}{\sin^2 x} \stackrel{(\frac{2}{0})}{=} \frac{(1 + \cos^2 x)(1 - \cos^2 x)}{1 - \cos^2 x} = \frac{1 - \cos^2 x + \cos^2 x}{1 - \cos^2 x} = \frac{1+1}{1+1} = \frac{2}{2} = 1$$

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

(9)

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

$$= -\frac{2}{1 + \cos^2 \frac{\pi}{4}} = -\frac{2}{1 + \left(\frac{\sqrt{2}}{2}\right)^2} = -\frac{2}{1 + \frac{2}{4}} = -\frac{2}{1 + \frac{1}{2}} = -\frac{2}{\frac{3}{2}} = -\frac{4}{3}$$

(10)