

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

$(x-1)$
 0/0 \rightarrow $\frac{0}{0}$ \rightarrow $\frac{1}{2}$

$$2) \lim_{x \rightarrow 0} \frac{|x-1| - |x+1|}{x}$$

$(x-0)$
 0/0 \rightarrow $\frac{1-x}{x} - \frac{x+1}{x} = \frac{1-x-x-1}{x} = \frac{-2x}{x} = -2$

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

$(x-4)$
 0/0 \rightarrow $\frac{4}{4} = 1$

$$4) \lim_{x \rightarrow 2} \frac{x - \sqrt{2x}}{2x^2 - 11x + 9} = \frac{(x - \sqrt{2x})(x + \sqrt{2x})}{(x-2)(2x+3)(x + \sqrt{2x})} = \frac{x^2 - 2x}{(x-2)(2x+3)(x + \sqrt{2x})}$$

$(x-2) \rightarrow \frac{0}{0}$ \rightarrow $\frac{2}{(7)(4)} = \frac{1}{14}$

$$5) \lim_{x \rightarrow 4} \frac{\sqrt{3x+4} - 4}{\sqrt{2x+6} - 4} \times \frac{\sqrt{3x+4} + 4}{\sqrt{3x+4} + 4} \times \frac{\sqrt{(2x+6)^2 + 9} - 3\sqrt{2x+6}}{\sqrt{(2x+6)^2 + 9} - 3\sqrt{2x+6}} \times \frac{3\sqrt{2x+6} + 3\sqrt{2x+6}}{3\sqrt{2x+6} + 3\sqrt{2x+6}}$$

$(x-4)$
 $\rightarrow 3x(9+9+9) = 81$
 $\rightarrow 5x(4+4) = 40$

$$6) \lim_{x \rightarrow 1} \frac{1-\sqrt{x}}{1-\sqrt{1-x}} \times \frac{1+\sqrt{x}}{1+\sqrt{x}} \times \frac{1+\sqrt{1-x}}{1+\sqrt{1-x}} \rightarrow (x-1) \text{ صفر}$$

$$= \frac{(1-x)}{1+\sqrt{x}} \cdot \frac{1+\sqrt{1-x}}{1-x} = (-1) \times \frac{1+1}{2} = (-2)$$

$$7) \lim_{x \rightarrow 1} \frac{\sqrt[3]{x+\sqrt{x}} - 1}{\sqrt[3]{x} - 1} \times \frac{\sqrt[3]{x^2+1} + \sqrt[3]{x}}{\sqrt[3]{x^2+1} + \sqrt[3]{x}} \times \frac{\sqrt[3]{x+\sqrt{x}} + 2}{\sqrt[3]{x+\sqrt{x}} + 2}$$

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

$$8) \lim_{x \rightarrow \pi} \frac{1 + \cos^2 x}{\sin^2 x} = \frac{(1 + \cos^2 x)(1 + \cos^2 x - \cos^2 x)}{(1 - \cos^2 x)(1 + \cos^2 x)} = \frac{1+1+1}{1-1} = \frac{3}{0}$$

$$9) \lim_{x \rightarrow \frac{\pi}{4}} \frac{1 - \tan x}{\sin x - \cos x} = \frac{\cos x - \sin x}{\cos x} \times \frac{-\cos x + \sin x}{-\cos x + \sin x} = \frac{-1}{\cos \frac{\pi}{4}} = \frac{-1}{\frac{1}{\sqrt{2}}} = -\sqrt{2}$$

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

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