

$$\lim_{x \rightarrow 1} \frac{x^2 - \sqrt{x+1}}{5x^2 - 11x + 4} = \frac{0}{0} \rightarrow \frac{(x-1)(x^2-3)}{(x-1)(5x-4)} = \frac{1}{1}$$

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

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

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

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$$\lim_{x \rightarrow 1} \frac{1 - \sqrt{x}}{1 - \sqrt{5-x}} = \frac{0}{0} \rightarrow \lim_{x \rightarrow 1} \frac{1 - \sqrt{x}}{1 - \sqrt{5-x}} \times \frac{1 + \sqrt{x}}{1 + \sqrt{x}} \times \frac{1 + \sqrt{5-x}}{1 + \sqrt{5-x}} = -1 \times \frac{1-x}{1-\sqrt{5-x}} \times \frac{1 + \sqrt{5-x}}{1 + \sqrt{x}} = -1 \times \frac{1-x}{1+\sqrt{1}} = -1 \times \frac{1}{2} = -\frac{1}{2}$$

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$$\lim_{x \rightarrow \sqrt{a}} \frac{\sqrt{ax+k} - k}{\sqrt{ax+V} - k} = \frac{0}{0} \rightarrow \lim_{x \rightarrow \sqrt{a}} \frac{\sqrt{ax+k} - k}{\sqrt{ax+V} - k} \times \frac{\sqrt{ax+k} + k}{\sqrt{ax+k} + k} \times \frac{\sqrt{(ax+V)^2 + k\sqrt{ax+V} + 9}}{\sqrt{(ax+V)^2 + k\sqrt{ax+V} + 9}}$$

$$= \frac{kx - k = k(x-k)}{ax+V-kV} \times \frac{\sqrt{(ax+V)^2 + k\sqrt{ax+V} + 9}}{\sqrt{ax+k} + k} = \frac{k}{a} \times \frac{9+9+9}{\Delta} = \frac{11}{F_0}$$

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$$\lim_{x \rightarrow 1} \frac{\sqrt{ax+\sqrt{x}} - k}{\sqrt{x} - 1} = \frac{0}{0} \rightarrow \frac{\sqrt{ax+\sqrt{x}} - k}{\sqrt{x} - 1} \times \frac{\sqrt{ax+\sqrt{x}} + k}{\sqrt{ax+\sqrt{x}} + k} \times \frac{\sqrt{x} + \sqrt{x} + 1}{\sqrt{x} + \sqrt{x} + 1}$$

$$= \frac{kx + \sqrt{x} - k}{x-1} \times \frac{k}{k} = \frac{(\sqrt{x}-1)(k\sqrt{x}+k)}{(\sqrt{x}+1)(\sqrt{x}-1)} = \frac{V}{F} \times \frac{k}{k} = \frac{V1}{\Delta}$$

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

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

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

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

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