

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

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$$\lim_{x \rightarrow 0} \frac{|3x-1| - |3x+1|}{x} = \frac{|-1| - |1|}{x} = \frac{-1 - 1}{x} = -\frac{2}{x} = -\infty$$

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

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

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

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$$\lim_{x \rightarrow f_0} \frac{\sqrt{ax+b} - c}{\sqrt{ax+b} - c} \times \frac{\sqrt{ax+b} + c}{\sqrt{ax+b} + c} \times \frac{\sqrt{(ax+b)^2 + 9} + c\sqrt{ax+b}}{\sqrt{(ax+b)^2 + 9} + c\sqrt{ax+b}} = \frac{1 \cdot (12-f)}{f_0 (12-f)} = \frac{11}{f_0}$$

9

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

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

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

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

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