

$$\lim_{x \rightarrow 1} \frac{4x^2 - 7x + 3}{5x^2 - 11x + 3} = \frac{4(x-1)(x-\frac{3}{4})}{5(x-1)(x-\frac{3}{5})} = \frac{4x-3}{5x-3} = \frac{1}{2}$$

$$\lim_{x \rightarrow 0} \frac{1 - 3x - 3x - 1}{x} = \frac{-6x}{x} = -6$$

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

$$\lim_{x \rightarrow 2} \frac{x - \sqrt{2x}}{2x^2 - x - 6} \xrightarrow{hop} \frac{2 - \frac{\sqrt{2}}{\sqrt{2x}}}{4x - 1} = \frac{1}{\sqrt{2}}$$

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

$$\lim_{x \rightarrow 4} \frac{\sqrt{3x+4} - 4}{\sqrt{5x+7} - 3} \times \frac{\sqrt{3x+4} + 4}{\sqrt{3x+4} + 4} \times \frac{\sqrt{5x+7} + 3}{\sqrt{5x+7} + 3} = \frac{11}{8}$$

$$\frac{3x-12}{5x-20} \times \frac{27}{1} = \frac{11}{8}$$

$$\lim_{x \rightarrow 1} \frac{\sqrt{x+2} - 2}{\sqrt{x} - 1} \times \frac{\cos x}{\cos x} \times \frac{\cos x}{\cos x} = \frac{x+2 - 4}{x-1} \times \frac{x}{2} \rightarrow -\infty$$

$$\text{h.o.p} \Rightarrow \frac{x + \frac{1}{\sqrt{x}}}{1} \times \frac{x}{2} = \frac{x + \frac{1}{\sqrt{x}}}{1} \times \frac{x}{2} = \frac{x + \frac{1}{\sqrt{x}}}{2}$$

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

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

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