$$\lim_{x\to 1}\frac{4x^2-7x+3}{5x^2-9x+4}=\lim_{x\to 1}\frac{(x-1)(4x-3)}{(x-1)(5x-4)}=\frac{1}{4}$$

$$\lim_{x\to 0}\frac{|\sqrt{3}x-1|-|\sqrt{3}x+1|}{x}=\frac{0}{0}$$

$$\lim\frac{-(\sqrt{3}x-1)-(\sqrt{3}x+1)}{x}=\lim\frac{-\sqrt{3}x+1-\sqrt{3}x-1}{x}=\lim\frac{-4\sqrt{3}x}{x}=-4$$

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

$$\lim_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6}=\lim\frac{x-\sqrt{2x}}{(x-2)(2x+3)}\times\frac{x+\sqrt{2x}}{x+\sqrt{2x}}=\lim\frac{x^2-2x}{(x-2)(2x+3)(x+\sqrt{2x})}$$

$$=\frac{2}{(4+3)(2+2)}=\frac{2}{7\times 4}=\frac{1}{14}$$

$$\lim_{x\to 1}\frac{1-\sqrt{x}}{3-\sqrt{5-x}}=\lim\frac{1-\sqrt{x}}{2-\sqrt{5-x}}\times\frac{1+\sqrt{x}}{1+\sqrt{x}}\times\frac{2+\sqrt{5-x}}{2+\sqrt{5-x}}=$$

$$\lim\frac{(1-x)}{4-(5-x)}\times\frac{2+\sqrt{5-x}}{1+\sqrt{x}}=\lim\frac{1-x}{x-1}\times\frac{2+\sqrt{5-x}}{1+\sqrt{x}}=-1\times\frac{4}{2}=-2$$

$$\lim_{x\to 4}\frac{\sqrt{2x+4}-4}{\sqrt[3]{5x+7}-\sqrt[3]{27}}\times\frac{\sqrt{2x+4}+4}{\sqrt{2x+4}+4}\times\frac{\left(\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9\right)}{\left(\sqrt[3]{(5x+7)^2}-3\sqrt[3]{5x+7}+9\right)}=$$

$$\lim\frac{2(x-4)}{2x-12}\times\frac{\left(\sqrt[3]{(5x+7)^2}+3\sqrt[3]{5x+7}+9\right)}{(5x+7)-27}\times\frac{\sqrt{2x+4}+4}{\sqrt{2x+4}+4}=\frac{2}{5}\times\frac{\sqrt[3]{9}+3\sqrt[3]{27}+9}{\sqrt{16}+4}=$$

$$\frac{2}{5}\times\frac{21}{8}=\frac{42}{40}$$

$$\lim_{x\to 1}\frac{\sqrt{2x+\sqrt{x}}-2}{\sqrt[3]{x}-1}=\frac{0}{0}\xrightarrow{\text{hop}}\lim_{x\to 1}\frac{\left(2+\frac{1}{2\sqrt{x}}\right)\Big/2\sqrt{2x+\sqrt{x}}}{\frac{1}{3\sqrt[3]{x^2}}}=\frac{7}{8}$$

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

$$\frac{1-(-1)+1}{1+1}=\frac{3}{2}$$

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

$$-\frac{2}{\sqrt{2}}$$

$$\lim_{x \to \frac{3\pi}{4}} \frac{\tan^2 x - 1}{\cos 2x} = \frac{0}{0} \to \lim_{x \to \frac{3\pi}{4}} \frac{\tan^2 x - 1}{\cos 2x} = \lim \frac{\frac{\sin^2 x - \cos^2 x}{\cos^2 x}}{\frac{\cos^2 x - \sin^2 x}{1}} =$$

$$\lim \frac{\sin^2 x - \cos^2 x}{-\cos^2 x(\sin^2 x - \cos^2 x)} = \lim \frac{-1}{\cos^2 x} =$$