

$$\lim_{n \rightarrow 1} \frac{fn^r - vn + r}{an^r - \lambda n + r} \stackrel{0}{=} \frac{f - v + r}{a - \lambda + r} \stackrel{H}{=} \frac{1 - 0}{r - 0} \stackrel{n=1}{=} \frac{1}{r} \quad (r) - 1$$

$$\lim_{n \rightarrow 0} \frac{|rx-1| - |r(x+1)|}{x} \stackrel{0^+}{\rightarrow} \frac{1-rx - rx-1}{x} = \frac{-2x}{x} = -2$$

$$\lim_{n \rightarrow 0} \frac{|rx-1| - |r(x+1)|}{x} \stackrel{0^-}{\rightarrow} \frac{1-rx - rx-1}{x} = \frac{-2x}{x} = -2$$

$$\lim_{n \rightarrow 0} \frac{|rx-1| - |r(x+1)|}{x} = -2 \quad (r) - 2$$

$$\lim_{x \rightarrow f} \frac{x-f}{\sqrt{x}-r} \stackrel{f}{\rightarrow} \frac{f-f}{\sqrt{f}-r} = \frac{0}{0} \stackrel{H}{\rightarrow} \frac{1-0}{\frac{1}{2\sqrt{x}}-0} \stackrel{x=f}{=} \frac{1}{\frac{1}{2\sqrt{f}}} = 2\sqrt{f} \quad (r) - f_0$$

$$\lim_{x \rightarrow r} \frac{x - \sqrt{rx}}{rx^r - x - r} \stackrel{r}{\rightarrow} \frac{r - \sqrt{r^2}}{\lambda - r - r} = \frac{0}{0} \stackrel{H}{\rightarrow} \frac{1 - \frac{r}{2\sqrt{rx}}}{r(x-1)}$$

$$\frac{1 - \frac{r}{2\sqrt{rx}}}{r(x-1)} \stackrel{x=r}{=} \frac{1 - \frac{r}{2\sqrt{r^2}}}{r(r-1)} = \frac{1 - \frac{1}{2}}{r(r-1)} = \frac{1}{2r(r-1)}$$

$$\lim_{x \rightarrow r} \frac{x - \sqrt{rx}}{rx^r - x - r} = \frac{1}{2r(r-1)} \quad (r) - r$$

$$\lim_{x \rightarrow 1} \frac{1 - \sqrt{x}}{r - \sqrt{a-x}} \rightarrow \frac{0}{0} \rightarrow \frac{1 - \sqrt{x}}{r - \sqrt{a-x}} \times \frac{1 + \sqrt{x}}{1 + \sqrt{x}} \times \frac{r + \sqrt{a-x}}{r + \sqrt{a-x}} = \frac{1-x}{-1+x} \times \frac{r + \sqrt{a-x}}{1 + \sqrt{x}}$$

$$\frac{1-x}{-1+x} \times \frac{r + \sqrt{a-x}}{1 + \sqrt{x}} \stackrel{x=1}{=} \frac{1-1}{-1+1} \times \frac{r + \sqrt{a-1}}{1 + \sqrt{1}} = \frac{0}{0} \times \dots$$

$$\frac{1-x}{-1+x} \stackrel{x=1}{=} -1 \quad (r) - 3$$

$$\lim_{x \rightarrow f} \frac{\sqrt{rx+f} - f}{\sqrt{ax+v} - r} \stackrel{f}{\rightarrow} \frac{0}{0} \stackrel{H}{\rightarrow} \frac{\frac{r}{2\sqrt{rx+f}}}{\frac{a}{2\sqrt{ax+v}}}$$

$$\frac{\frac{r}{2\sqrt{rx+f}}}{\frac{a}{2\sqrt{ax+v}}} = \frac{r\sqrt{ax+v}}{a\sqrt{rx+f}} \stackrel{f}{\rightarrow} \frac{r\sqrt{af+v}}{a\sqrt{rf+f}} = \frac{r\sqrt{af+v}}{a\sqrt{f(r+1)}} \quad (r) - 4$$

$$\lim_{x \rightarrow 1} \frac{\sqrt{rx+\sqrt{x}} - r}{\sqrt{x} - 1} \rightarrow \frac{0}{0} \stackrel{H}{\rightarrow} \frac{r + \frac{1}{2\sqrt{x}}}{\frac{1}{2\sqrt{x}}}$$

$$\frac{r + \frac{1}{2\sqrt{x}}}{\frac{1}{2\sqrt{x}}} \rightarrow \frac{(r\sqrt{x} + \frac{1}{2}) \cdot (r + \frac{1}{2\sqrt{x}})}{\frac{1}{2\sqrt{x}}}$$

$$\frac{(r\sqrt{x} + \frac{1}{2}) \cdot (r + \frac{1}{2\sqrt{x}})}{\frac{1}{2\sqrt{x}}} \stackrel{x=1}{=} \frac{(r + \frac{1}{2}) \cdot (r + \frac{1}{2})}{\frac{1}{2}} = \frac{(r + \frac{1}{2})^2}{\frac{1}{2}} = 2(r + \frac{1}{2})^2 \quad (r) - 5$$

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

$$\frac{(1 + \cos^2 x)(1 - \cos^2 x + \cos^4 x)}{(1 - \cos x)(1 + \cos x)} \stackrel{x=\pi}{=} \frac{(1 + \cos^2 \pi)(1 - \cos^2 \pi + \cos^4 \pi)}{(1 - \cos \pi)(1 + \cos \pi)} = \frac{(1 + 1)(1 - 1 + 1)}{(1 - (-1))(1 + (-1))} = \frac{2 \cdot 1}{0} = \infty \quad (r) - 6$$

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{1 - \tan x}{\sin x - \cos x} \rightarrow \frac{1 - \frac{\sin}{\cos}}{\sin - \cos} = \frac{\cos - \sin}{\sin - \cos} = -1 \stackrel{x=\frac{\pi}{2}}{\rightarrow} \frac{-1}{\cos \frac{\pi}{2}} = \frac{-1}{0} = \infty \quad (r) - 7$$

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{\tan^2 x - 1}{\cos^2 x} = \frac{\frac{\sin^2}{\cos^2} - 1}{\cos^2 x} = \frac{\sin^2 - \cos^2}{\cos^2 x} = \frac{-1}{\cos^2 \frac{\pi}{2}} = \frac{-1}{0} = \infty \quad (r) - 10$$