

(1)

$$\frac{x^2 - \sqrt{x} + 3}{x^2 - 1} \xrightarrow{\div x-1} \frac{(x-1)(x+3)}{(x-1)(x+1)}$$

$$\lim_{x \rightarrow 1} \frac{x^2 - \sqrt{x} + 3}{x^2 - 1} = \frac{(1-1)(1+3)}{(1-1)(1+1)} = \left( \frac{1}{1} \right)$$

(2)

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

(3)

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

(4)

$$\lim_{x \rightarrow 1} \frac{x - \sqrt{x}}{x^2 - x - 2} \times \frac{0/0}{0/0} = \frac{x^2 - 2x}{x^2 - x - 2} \times \frac{1}{x + \sqrt{x}} \rightarrow \frac{x(x-1)}{(x-1)(x+2)} \times \frac{1}{1} = \left( \frac{1}{3} \right)$$

(5)

$$\lim_{x \rightarrow 1} \frac{1 - \sqrt{x}}{1 - \sqrt{0-x}} \times \frac{0/0}{0/0} \times \frac{0/0}{0/0} = \lim_{x \rightarrow 1} \frac{1-x}{x-1} \times \frac{1}{1} = (-1)$$

(6)

$$\lim_{x \rightarrow 1} \frac{\sqrt{x+1} - 1}{\sqrt{0x+1} - 1} \times \frac{0/0}{0/0} \times \frac{0/0}{0/0} = \lim_{x \rightarrow 1} \frac{\sqrt{x+1} - 1}{0x+1-1} \times \frac{1}{1} = \left( \frac{1}{1} \right)$$

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

$$\frac{(\sqrt{u}-1)(r(\sqrt{u+1})+1)}{(\sqrt{u}-1)(\sqrt{u+1})} \times \frac{r}{r} = \left(\frac{r}{\sqrt{u+1}}\right) \quad (17)$$

فيل وفيلون

$$\lim_{u \rightarrow \pi} \frac{1 + \cos u}{\sin^2 u} = \frac{(1 + \cos u)(\cos u - \cos u + 1)}{(1 - \cos u)(1 + \cos u)} = \lim_{u \rightarrow \pi} \frac{\cos u - \cos u + 1}{1 - \cos u} = \left(\frac{r}{r}\right)$$

$\downarrow = 1 - \cos^2 u$

(1)

$$\lim_{u \rightarrow \frac{\pi}{2}} \frac{1 - \tan u}{\sin u - \cos u} = \frac{\cos u - \sin u}{\cos u - \sin u} = \frac{\cos u - \sin u}{\cos u} = \frac{-1}{\cos u} = \frac{-1}{\frac{1}{\sqrt{2}}} = \frac{-1}{\frac{1}{\sqrt{2}}} = \frac{-\sqrt{2}}{1} = \boxed{\frac{r}{\sqrt{r}}} \downarrow \boxed{-\sqrt{r}}$$

(9)

$$\lim_{u \rightarrow \frac{\pi}{4}} \frac{\tan^2 u - 1}{\cos^2 u} = \lim_{u \rightarrow \frac{\pi}{4}} \frac{\tan^2 u - 1}{1 + \tan^2 u} = \lim_{u \rightarrow \frac{\pi}{4}} \frac{-1 - \tan^2 u}{1 + \tan^2 u} = \boxed{-2}$$

(6)