

羅必達法則練習題

試求下列各項極限.

$$1. \lim_{x \rightarrow 0} \frac{e^{-x} - 1}{3x} \quad \text{解. } -\frac{1}{3}$$

$$2. \lim_{x \rightarrow 0} \frac{\sin x}{5x} \quad \text{解. } \frac{1}{5}$$

$$3. \lim_{x \rightarrow 0} \frac{\cos 2x - 1}{6x} \quad \text{解. } 0$$

$$4. \lim_{x \rightarrow \infty} \frac{\ln x}{x^2 - 1} \quad \text{解. } 0$$

$$5. \lim_{x \rightarrow 1^-} \frac{e^{x-1}}{x^2 - 1} \quad \text{解. } -\infty$$

$$6. \lim_{x \rightarrow \infty} \frac{(\ln x)^2}{e^x} \quad \text{解. } 0$$

$$7. \lim_{x \rightarrow 0} \frac{\tan 2x}{x} \quad \text{解. } 2$$

$$8. \lim_{x \rightarrow 1} \frac{x - 1}{\sqrt{x} - 1} \quad \text{解. } 2$$

$$9. \lim_{x \rightarrow \infty} \frac{x}{\sqrt{x + 1}} \quad \text{解. } \infty$$

$$10. \lim_{x \rightarrow 0} \frac{\sqrt{4 - x^2} - 2}{x} \quad \text{解. } 0$$

$$11. \lim_{x \rightarrow \infty} \frac{x^2}{e^x \ln x} \quad \text{解. } 0$$

$$12. \lim_{x \rightarrow -1} \frac{\ln(x + 2)}{x + 2} \quad \text{解. } 0$$

$$13. \lim_{x \rightarrow 1} \frac{2 \ln x}{e^x} \quad \text{解. } 0$$

$$14. \lim_{x \rightarrow 1^-} \frac{e^x - 1}{\ln x} \quad \text{解. } -\infty$$

$$15. \lim_{x \rightarrow -2^-} \frac{\sqrt{x^2 - 4} - 5}{x + 2} \quad \text{解. } \infty$$

$$16. \lim_{x \rightarrow -\infty} \frac{x}{\sqrt{x^2 + 1}} \quad \text{解. } -1$$

$$17. \lim_{n \rightarrow \infty} P \left(1 + \frac{r}{n}\right)^{nt} \quad \text{解. } Pe^{rt}$$

$$18. \lim_{x \rightarrow -\infty} xe^x \quad \text{解. } 0$$