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100

1 $f(e^x \quad 1) \quad e^{2x} \quad e^x \quad x \qquad f(x).$

$e^x \quad 1 \quad u \quad x \quad \ln(u \quad 1)$

$$f(u) \quad (u \quad 1)^2 \quad (u \quad 1) \quad \ln(u \quad 1) \quad u^2 \quad u \quad \ln(u \quad 1)$$

$$f(x) \quad {}^2x \quad x\ \ln\ (x$$

2 $\lim\limits_{x \quad 0}\dfrac{\sin x \quad \sin\ \sin x \quad \sin x}{x^4}$

$$\lim_{x \quad 0}\frac{(\sin x \quad \sin\sin x)\sin x}{x^4} \quad \lim_{x \quad 0}\frac{\sin x \quad \sin\sin x}{x^3} \quad \lim_{x \quad 0}\frac{\cos x \quad \cos(\sin x)\ \cos x}{3x^2}$$

$$\lim_{x \quad 0}\frac{\cos x(1 \quad \cos(\sin x))}{3x^2} \quad \lim_{x \quad 0}\frac{\sin(\sin x)\ \cos x}{6x}$$

$$\lim_{x \quad 0}\frac{\sin x}{6x} \quad \frac{1}{6}$$

3 $\lim\limits_{n}\dfrac{3^{n \quad 1} \quad 2^n}{2^{n \quad 1} \quad 3^n}$

$$\lim_{n} \frac{3 \quad \left(\frac{2}{3}\right)^{n}}{2 \left(\frac{2}{3}\right)^{n} \quad 1} \quad 3$$

$$|r| \quad 1 \qquad \lim_{n} r^{n} \quad 0$$

4

$$\sqrt{} \quad \sqrt{} \qquad \lim_{x \quad 0} \frac{\sqrt[3]{1 \quad x} \quad \sqrt[3]{1 \quad x}}{x}$$

$$\lim_{x \quad 0} \frac{1 \quad x \quad\quad 1 \quad x}{x \ \sqrt{1 \quad x} \quad \sqrt{1 \quad x}} \quad \frac{2}{2} \quad 1$$

$$\lim_{x \quad 0} \frac{\sqrt{1 \quad x} \quad 1 \quad\quad \sqrt{1 \quad x} \quad 1}{x}$$

$$\lim_{x \quad 0} \frac{\frac{1}{2} x \quad\quad \frac{x}{2}}{x} \quad 1$$

$$\lim_{x \quad 0} \frac{\frac{1}{2\sqrt{1 \quad x}} \quad\quad \frac{1}{2\sqrt{1 \quad x}}}{1} \quad 1$$

$$\lim_{x \quad 0} \frac{1 \quad x \quad\quad 1 \quad x}{x \quad \sqrt[3]{1 \quad x}^{\,2} \quad \sqrt[3]{1 \quad x} \ \sqrt[3]{1 \quad x} \quad \sqrt[3]{1 \quad x}^{\,2}} \quad \frac{2}{3}$$

1

1

$$2 \quad \lim_{n} \ 1 \quad \frac{1}{2^{2}} \quad 1 \quad \frac{1}{3^{2}} \ \cdots \ 1 \quad \frac{1}{n^{2}}$$

$$\lim_{n} \ 1 \quad \frac{1}{2} \quad 1 \quad \frac{1}{2} \quad 1 \quad \frac{1}{3} \quad 1 \quad \frac{1}{3} \ \cdots \ 1 \quad \frac{1}{n} \quad 1 \quad \frac{1}{n}$$

$$\lim_{n} \frac{1}{2} \cdot \frac{3}{2} \cdot \frac{2}{3} \cdot \frac{4}{3} \cdots \frac{n \quad 1}{n} \cdot \frac{n \quad 1}{n} \qquad \lim_{n} \frac{n \quad 1}{2n} \quad \frac{1}{2}$$

5

$$1 \quad \lim_{x} \ 1 \quad \frac{2}{x}^{\,x \quad 10} \qquad\qquad \lim_{x \quad 0} \ \frac{1 \quad x}{1 \quad x}^{\frac{1}{x}}$$

$$1 \quad \lim_{n} \ 1 \quad \frac{2}{x}^{\,x \quad 10} \qquad \lim_{x} \ 1 \quad\quad \frac{2}{x}^{\frac{x}{2} \quad \frac{2(x \quad 10)}{x}}$$

$$\lim_{x} \quad 1 \quad\quad \frac{2}{x}^{\frac{x}{2}} {}^{2 \quad 1 \quad \frac{10}{x}} \qquad\qquad e^{\ 2}$$

$$\lim_{x\ \ 0}\frac{1\ \ x}{1\ \ x}^{\frac{1}{x}}\quad \frac{\lim\limits_{x\ \ 0} 1\ \ x^{\frac{1}{x}}}{\lim\limits_{x\ \ 0} 1\ \ x^{\frac{1}{x}}}\quad \frac{\lim\limits_{x\ \ 0} 1\ \ (\ \ x)^{\frac{1}{x}\ (\ \ 1)}}{e}\quad \frac{e^{\ 1}}{e}\quad e^{\ 2}$$

$$\lim_{x\ \ 0}\frac{1\ \ x}{1\ \ x}^{\frac{1}{x}}\quad \lim_{x\ \ 0}\frac{1\ \ x\ \ 2x}{1\ \ x}^{\frac{1}{x}}\quad \lim_{x\ \ 0} 1\ \ \frac{2x}{1\ \ x}^{\frac{1\ \ x}{2x}\ \frac{2}{1\ \ x}}\quad e^{\ 2}$$

6

1 $\lim\limits_{x\ \ 0}(1\ \ \tan x)^{\cot x}$ $\qquad\qquad \lim\limits_{x\ \ 1} x^{\frac{4}{x\ \ 1}}$

$\lim\limits_{x\ \ 0}(\cos x)^{\cot^2 x}$

$$\tan x\ \ t\ \ \cot x\ \ \frac{1}{t}\qquad x\ \ 0\ \ t\ \ 0$$

$$\lim_{x\ \ 0}(1\ \ \tan x)^{c\ \ \propto\ \ t}\ \lim_{t\ \ 0}(1\ \ t)^{\frac{1}{t}}\ \ e$$

$$x\ \ 1\ \ t\quad x\ \ 1\ \ t\qquad x\ \ 1\qquad t\ \ 0$$

$$\lim_{x\ \ 1} x^{\frac{4}{x\ \ 1}}\quad \lim_{t\ \ 0}(1\ \ t)^{\frac{4}{t}}\quad \lim_{t\ \ 0}\ 1\ \ t^{\frac{1}{t}\ \ 4}\qquad e^4$$

$$\lim_{x\ \ 0}(\cos x)^{\cot^2 x}\quad \lim_{x\ \ 0}(1\ \ \sin^2 x)^{\frac{\cos^2 x}{2\sin^2 x}}\quad \lim_{x\ \ 0}\ 1\ \ (\ \ \sin^2 x)^{\ \frac{1}{\sin^2 x}\ \frac{\cos^2 x}{2}}$$

$$e^{\ \frac{1}{2}}$$

7

1 $\lim\limits_{n}\sum\limits_{k\ 1}^{n}\frac{1}{\sqrt{n^2\ \ k}}$ $\qquad\qquad \lim\limits_{n}\sum\limits_{k\ 1}^{n}\frac{k}{n^2\ \ n\ \ k}$

$$1\qquad \frac{n}{\sqrt{n^2\ \ n}}\quad \sum_{k\ 1}^{n}\frac{1}{\sqrt{n^2\ \ k}}\quad \frac{n}{\sqrt{n^2\ \ 1}}$$

$$\lim_{n}\frac{n}{\sqrt{n^2\ \ n}}\quad \lim_{n}\frac{1}{\sqrt{1\ \ \frac{1}{n}}}$$

$$\lim_{n}\frac{n}{\sqrt{n^2\ \ 1}}\quad \lim_{n}\frac{1}{\sqrt{1\ \ \frac{1}{n^2}}}\quad 1$$

$$\lim_{n}\sum_{k\ 1}^{n}\frac{1}{\sqrt{n^2\ \ k}}\quad 1$$

$$\frac{1\ \ 2\ \ \cdots\ \ n}{n^2\ \ n\ \ n}\quad \sum_{k\ 1}^{n}\frac{k}{n^2\ \ n\ \ k}\quad \frac{1\ \ 2\ \ \cdots\ \ n}{n^2\ \ n\ \ 1}$$

$$\lim_{n}\frac{1\ \ 2\ \cdots\ \ n}{n^2\ \ 2n}\quad \lim_{n}\frac{\frac{1}{2}n(n\ \ 1)}{n(n\ \ 2)}\ -$$

$$\lim_{n} \frac{1 \quad 2 \quad \cdots \quad n}{n^2 \quad n \quad 1} \quad \lim_{n} \frac{\frac{1}{2}n(n \quad 1)}{n^2 \quad n \quad 1} \quad \frac{1}{2}$$

$$\lim_{n} {}_{k\ 1}^{n} \frac{k}{n^2 \quad n \quad k} \quad \frac{1}{2}$$

8 $\lim_{n} {}_{k\ 1}^{n}\frac{n}{n^2 \quad k^2}$

复

$$\frac{n^2}{n^2\quad n^2} \quad {}_{k\ 1}^{n}\frac{n}{n^2\quad k^2} \quad \frac{n^2}{n^2\quad 1^2}$$

$$\lim_{n} \frac{n^2}{n^2 \quad n^2} \quad \frac{1}{2} \quad \lim_{n} \frac{n^2}{n^2\quad 1^2} \quad 1$$

$$\lim_{n} {}_{k\ 1}^{n} \frac{n}{n^2\quad k^2} \quad \lim_{n} \frac{1}{n} {}_{k\ 1}^{n} \frac{1}{1 \quad \left(\frac{k}{n}\right)^2}$$

$$ {}_{0}^{1} \frac{dx}{1\quad x^2} \quad \arctan x\Big|_0^1 \quad \frac{\ }{4}$$

9 $\lim_{n} \frac{\frac{1}{n} \quad \sin\frac{1}{n}}{\sin^3\frac{1}{n}}.$

$$\lim_{x\ 0}\frac{x\quad \sin x}{\sin^3 x} \overline{\overline{\qquad\quad}} \lim_{x\ 0}\frac{x\quad\sin x}{x^3}$$

$$\lim_{x\ 0}\frac{1\quad\cos x}{3x^2}\quad\lim_{x\ 0}\frac{\sin x}{6x}\quad\frac{1}{6}$$

$$\frac{1}{6}.$$

10 $\lim_{x\ 0}\frac{e^{\frac{1}{x^2}}}{x^{10}}.$

$\frac{0}{0}$ $\lim_{x\ 0}\frac{\frac{2}{x^3}\ e^{\frac{1}{x^2}}}{10x^9}\quad\lim_{x\ 0}\frac{e^{\frac{1}{x^2}}}{5x^{12}}$ 利 别

$$\frac{1}{x^2}\quad t$$

$$\lim_{x\ 0}\frac{e^{\frac{1}{x^2}}}{x^{10}}\quad {}_{t}\ \lim\frac{e^t}{t^5}\quad {}_{t}\ \frac{5}{t} \quad —$$

$$\lim_{t}\frac{5t^4}{e^t}\quad\cdots\quad\lim_{t}\frac{5!}{e^t}\quad 0$$

11 $\lim\limits_{x\quad 0} \frac{1}{x} \quad \frac{1}{e^x \quad 1}$.

$$\lim_{x\quad 0} \frac{1}{x} \quad \frac{1}{e^x \quad 1} \qquad \lim_{x\quad 0} \frac{(e^x \quad 1) \quad x}{x(e^x \quad 1)} \qquad \frac{0}{0}$$

$$\lim_{x\quad 0} \frac{e^x \quad 1}{(e^x \quad 1) \quad xe^x} \qquad \lim_{x\quad 0} \frac{e^x}{e^x \quad e^x \quad xe^x}$$

$$\lim_{x\quad 0} \frac{1}{2 \quad x} \qquad \frac{1}{2}$$

12 $\lim\limits_{x\quad 0} (\frac{1}{\sin^2 x} \quad \frac{\cos^2 x}{x^2})$

$$\lim_{x\quad 0} \frac{x^2 \quad \sin^2 x \cos^2 x}{x^2 \sin^2 x}$$

$$\lim_{x\quad 0} \frac{x^2 \quad \frac{1}{4}\sin^2 2x}{x^4}$$

$$\lim_{x\quad 0} \frac{2x \quad \frac{4}{4}\sin 2x \cos 2x}{4x^3}$$

$$\lim_{x\quad 0} \frac{x \quad \frac{1}{4}\sin 4x}{2x^3}$$

$$\lim_{x\quad 0} \frac{1 \quad \cos 4x}{6x^2} \qquad \lim_{x\quad 0} \frac{4\sin 4x}{12x} \qquad \frac{4}{3}$$

13 $f(x) \quad \begin{matrix} x^2 \quad 1, & |x| \quad c \\ \frac{2}{|x|}, & |x| \quad c \end{matrix}$ $\quad (\quad , \quad) \qquad c$ ______.

1

$$\lim_{x\quad c} f \quad x \qquad \lim_{x\quad c} f \quad x \qquad c^2 \quad 1 \quad \frac{2}{c} \qquad c \quad 1$$

14 $\lim\limits_{x\quad 0} x^{\sin^2 x}$

$$y \quad x^{\sin^2 x} \qquad \ln y \quad \sin^2 x \ln x$$

$$\lim_{x\quad 0} \ln y \qquad \lim_{x\quad 0} \sin^2 x \ln x \quad 0$$

$$\lim_{x\quad 0} y \quad e^0 \quad 1$$

15 $\lim\limits_{x\quad 0} \cos x^{\cot^2 x}$

$$y \quad \cos x^{\cot^2 x} \qquad \ln y \quad \cot^2 x \ln \cos x$$

$$\lim_{x\quad 0} \ln y \qquad \lim_{x\quad 0} \cot^2 x \ln \cos x \qquad \lim_{x\quad 0} \frac{\ln \cos x}{\tan^2 x} \qquad \lim_{x\quad 0} \frac{\ln \cos x}{x^2}$$

$\frac{0}{0}$ $\lim_{x \quad 0}\frac{\tan x}{2x} \quad \frac{1}{2} \quad \lim_{x \quad 0} y \quad e^{\frac{1}{2}}$

16 $\lim_{x} \quad \sin\frac{1}{x} \quad \cos\frac{1}{x} \quad ^{x}$

$$\ln y \quad x\ln \quad \sin\frac{1}{x} \quad \cos\frac{1}{x}$$

$$\lim_{x}\ln y \quad \lim_{x}\frac{\ln \quad \sin\frac{1}{x} \quad \cos\frac{1}{x}}{\frac{1}{x}} \quad \lim_{t \quad 0}\frac{\ln(\sin t \quad \cos t)}{t}$$

$$\lim_{t \quad 0}\frac{\cos t \quad \sin t}{\sin t \quad \cos t} \quad 1$$

$$\lim_{x} y \quad e$$

17 $\lim_{x \quad 0}\frac{1}{x^2}\ln\frac{\sin x}{x}$.

$$\lim_{x \quad 0}\frac{1}{x^2}\ln\frac{\sin x}{x} \quad \lim_{x \quad 0}\frac{1}{x^2}\ln \quad 1 \quad \frac{\sin x}{x} \quad 1$$

$$\lim_{x \quad 0}\frac{\sin x \quad x}{x^3} \quad \lim_{x \quad 0}\frac{\cos x \quad 1}{3x^2} \quad \lim_{x \quad 0}\frac{\sin x}{6x} \quad \frac{1}{6}$$

18 $\lim_{x \quad 0}\frac{(1 \quad \cos 2x)\arctan 3x}{(e^x \quad 1)\ln(1 \quad 2x)\sin 5x}$

$$\lim_{x \quad 0}\frac{\frac{1}{2}(2x)^2 (3x)}{x (2x) (5x)} \quad \frac{3}{5}$$

19 $\lim_{x \quad 0}\frac{3\sin x \quad x^2\cos\frac{1}{x}}{(1 \quad \cos x)\ln(1 \quad x)}$

$$\frac{0}{0}$$

20 $\lim_{x \quad 0}\frac{\sin x \quad x \quad \frac{1}{6}x^3}{x^5}$

$$\sin x \quad x \quad \frac{x^3}{3!} \quad \frac{x^5}{5!} \quad o(x^5) \qquad x \quad 0$$

$$\lim_{x\quad 0}\frac{\frac{x^5}{5!}\quad o(x^5)}{x^5}\quad \frac{1}{5!}\quad \frac{1}{120}$$

21 $f\ (x_0)\quad 2$ $\lim_{x\quad 0}\frac{f(x_0\quad 3\ \ x)\quad f(x_0\quad 2\ \ x)}{x}$

$$\lim_{x\quad 0}\frac{f(x_0\quad 3\ \ x)\quad f(x_0)\qquad f(x_0\quad 2\ \ x)\quad f(x_0)}{x}$$

$$3\lim_{x\quad 0}\frac{f(x_0\quad 3\ \ x)\quad f(x_0)}{3\ \ x}\quad 2\lim_{x\quad 0}\frac{f(x_0\quad 2\ \ x)\quad f(x_0)}{2\ \ x}$$

$$3f\ (x_0)\quad 2f\ (x_0)\quad 5f\ (x_0)\quad 10$$

22 $y\quad f(x)\quad y\quad \sin x$ $\lim_{n} nf(\frac{2}{n})$

$$f(0)\quad 0\quad f\ (0)\quad (\sin x)\big|_{x\quad 0}\quad 1$$

$$\lim_{n} nf\ \frac{2}{n}\qquad \lim_{n}\frac{f\ \frac{2}{n}\quad f(\ 0\ )}{\frac{2}{n}\quad 0}\ 2\qquad f\qquad 2$$

23 $a\quad 0\quad x_1\quad b\quad 0\quad x_2\quad \frac{1}{2}\quad x_1\quad \frac{a}{x_1}$ $x_n\quad \frac{1}{2}\quad x_{n\ 1}\quad \frac{a}{x_{n\ 1}}$ $\lim_{n} x_n$

$x_n\quad \sqrt{x_{n\ 1}\ \frac{a}{x_{n\ 1}}}\quad \sqrt{a}\quad 0$ 八

$$x_{n\ 1}\quad x_n\quad \frac{1}{2}\quad x_n\quad \frac{a}{x_n}\qquad x_n\quad \frac{a\quad x_n^2}{2x_n}\quad 0\qquad x_{n\ 1}\quad x_n$$

x_n 1 $\lim_{n} x_n\quad A$

$x_n\quad \frac{1}{2}\quad x_{n\ 1}\quad \frac{a}{x_{n\ 1}}$ $A\quad \frac{1}{2}\quad A\quad \frac{a}{A}$

$A^2\quad a$ A 0 $A\quad \sqrt{a}$ $\lim_{n} x_n\quad \sqrt{a}$

24

$$f(x)\quad \begin{matrix} \frac{\sin 2x}{x} & x<0 \\ \frac{x^2}{1\quad \cos x} & x>0 \end{matrix}$$

$$f(0\quad 0)\quad \lim_{x\quad 0}\frac{\sin 2x}{x}\quad \lim_{x\quad 0} 2\frac{\sin 2x}{2x}\quad 2$$

$$f(0\quad 0)\quad \lim_{x\quad 0}\frac{x^2}{1\quad \cos x}\quad \lim_{x\quad 0}\frac{x^2}{\frac{1}{2}x^2}\quad 2$$

$\lim\limits_{x \quad 0} f(x) \quad 2$

25 $\lim\limits_{x \quad 0} \dfrac{2 \quad e^{\frac{1}{x}}}{1 \quad e^{\frac{4}{x}}} \quad \dfrac{\sin x}{|x|}$

$\lim\limits_{x \quad 0} \dfrac{2 \quad e^{\frac{1}{x}}}{1 \quad e^{\frac{4}{x}}} \quad \dfrac{\sin x}{(\quad x)} \quad 2 \quad 1 \quad 1$

$\lim\limits_{x \quad 0} \dfrac{2e^{\frac{4}{x}} \quad e^{\frac{3}{x}}}{e^{\frac{4}{x}} \quad 1} \quad \dfrac{\sin x}{x} \quad 0 \quad 1 \quad 1$

$\lim\limits_{x \quad 0} \dfrac{2 \quad e^{\frac{1}{x}}}{1 \quad e^{\frac{4}{x}}} \quad \dfrac{\sin x}{|x|} \quad 1$

26 $\lim\limits_{x \quad 1} \dfrac{x^2 \quad ax \quad b}{\sin(x^2 \quad 1)} \quad 3$ $\quad a \quad b.$

$\lim\limits_{x \quad 1}(x^2 \quad ax \quad b) \quad 0$

$\lim\limits_{x \quad 1} \dfrac{x^2 \quad ax \quad b}{\sin(x^2 \quad 1)} \quad \lim\limits_{x \quad 1} \dfrac{2x \quad a}{2x\cos(x^2 \quad 1)} \quad \dfrac{2 \quad a}{2} \quad 3 \quad a \quad 4, b \quad 5$

27 $f(x)$ $\quad \lim\limits_{x \quad 0} \dfrac{1 \quad \cos(\sin x)}{(e^{x^2} \quad 1) f(x)} \quad 1$ $\quad f(0)$ __________

$\dfrac{1}{2}$

$\lim\limits_{x \quad 0} \dfrac{\frac{1}{2}\sin^2 x}{x^2 f(x)} \quad 1, \quad \lim\limits_{x \quad 0} \dfrac{\frac{1}{2}}{f(x)} \quad 1$ $\quad f(x)$ $\quad f(0) \quad \dfrac{1}{2}$

28

$\frac{1}{}$ $\quad 0$

$0 \quad 0$

$0 \quad \_ \quad 0$

$x \quad 0$

$f \quad 0 \quad 0 \quad \lim\limits_{x \quad 0} f \quad x \quad \lim\limits_{x \quad 0} x\sin\dfrac{1}{x} \quad 0$

$f \quad 0 \quad 0$

$f\ 0\ \ 0 \quad f\ 0\ \ 0 \quad f\ 0 \quad f\ x \quad x\ \ 0$

29

$$f(x)=\begin{cases}\dfrac{\ln(1-\ x)}{x} & x<0\\ \dfrac{1}{2} \quad !!!!!!!!! & x=0\\ \dfrac{\sqrt{1+x}-1}{x} \quad !!! & x>0\end{cases}$$

$x\ \ 0$

$$f\ 0\ \ 0 \quad \lim_{x\ 0}\frac{\ln(1\ \ x)}{x} \quad \lim_{x\ 0}\ln(1\ \ x)^{\frac{1}{x}} \quad 1$$

$$f\ 0\ \ 0 \quad \lim_{x\ 0}\frac{\sqrt{1\ \ x}\ \ 1}{x} \quad \lim_{x\ 0}\frac{1}{\sqrt{1\ \ x}\ \ 1} \quad \frac{1}{2}$$

$$f\ 0\ \ 0 \quad f\ 0\ \ 0 \quad \lim_{x\ 0} f\ \ x \quad f\ \ x \quad x\ \ 0$$

30 $f(x)=\begin{cases}\dfrac{\sin x}{x} & x\ \ 0\\ k & x=0\end{cases}$ $x=0$ $k.$

$$\lim_{x\ 0} f\ \ x \quad \lim_{x\ 0}\frac{\sin x}{x} \quad 1$$

$f\ 0 \quad k \qquad k\ \ 1$

31 $f(x) \quad \dfrac{\sqrt[3]{x}\ \ 1}{x\ \ 1}$

$x\ \ 1$

$$\lim_{x\ 1}\frac{\sqrt[3]{x}\ \ 1}{x\ \ 1} \quad \lim_{x\ 1}\frac{\sqrt[3]{x}\ \ 1}{\sqrt[3]{x}\ \ 1\ \ \sqrt[3]{x^2}\ \ \sqrt[3]{x}\ \ 1}$$

$$\lim_{x\ 1}\frac{1}{\sqrt[3]{x^2}\ \ \sqrt[3]{x}\ \ 1} \quad \frac{1}{3}$$

$x\ \ 1 \quad f\ \ x$.

32 $f(x) \quad \dfrac{x^2\ \ 2x}{|x|\ \ x^2\ \ 4}$

$x\ \ 0\ \ -2\ \ 2 \qquad x\ \ 0\ \ -2\ \ 2$ . .

$x\ \ 0$

$$f(0\ \ 0) \quad \lim_{x\ 0}\frac{x(x\ \ 2)}{x(x\ \ 2)(x\ \ 2)} \quad \frac{1}{2} \qquad f(0\ \ 0) \quad \lim_{x\ 0}\frac{x(x\ \ 2)}{x(x\ \ 2)(x\ \ 2)} \quad \frac{1}{2}$$

$x\ \ 0$.

$x\ \ 2$

$f(\ 2\quad 0)\quad f(\ 2\quad 0)\quad \lim_{x\quad 2}\frac{x(x\quad 2)}{|x|(x\quad 2)(x\quad 2)}$

$x \quad 2$.
$x \quad 2$

$f(2\quad 0)\quad f(2\quad 0)\quad \lim_{x\quad 2}\ \frac{x(x\quad 2)}{x(x\quad 2)(x\quad 2)}\quad \frac{1}{4}$

$x\quad 2$. $f(2)\quad \frac{1}{4}$ $f\ \ x \quad x\quad 2$.

33 $f(x)\quad (\quad ,\quad)$ $\lim_{x} f(x)\quad a$

$g(x)\quad \begin{matrix} f\ \frac{1}{x} & x\quad 0 \\ 0 & x\quad 0 \end{matrix}$

36 $f(x)$ $[a \quad b]$ $f(a) \quad a$ $f(b) \quad b$ $f(x) \quad x$ $(a \quad b)$

$g(x) \quad f(x) \quad x$ $g(x)$ $[a \quad b]$

$g(a) \quad f(a) \quad a \quad 0$

$g(b) \quad f(b) \quad b \quad 0$

$g(x)$ $(a \quad b)$ $f(x) \quad x$ $(a \quad b)$

37 $e^x \quad e^{\ x} \quad 4 \quad \cos x$ $(\quad , \quad)$

$f(x) \quad e^x \quad e^{\ x} \quad \cos x \quad 4$ $f(x)$ $(0, \quad)$

$f(0) \quad 3 \quad 0$ ^{2} ^{2}

$f(x) \quad 0, 2$ $(0,2)$ $f(\ ) \quad 0$

$f\ (x) \quad e^x \quad e^{\ x} \quad \sin x \quad 0 \ x \quad 0$ $f(x)$ $(0, \quad)$ 别 $f(x)$ $(0, \quad)$

$f(x)$ $(0, \quad)$ $f(x)$ $(\quad , \quad)$

$(\quad , \quad)$

38 $f \ x \quad x \ a \ g \ x$ $g \ x$ a $f \ a$

∵ $g \ x$

$$f \ a \quad \lim_{x \ a} \frac{f \ x \quad f \ a}{x \ a} \quad \lim_{x \ a} \frac{x \ a \ g \ x \quad 0}{x \ a}$$

$= \lim_{x \ a} g \ x \quad g \ a$

39 $\sin \ xy \quad \ln \ y \ x \quad x$ $0,1$ ________.

$y \quad x \ 1.$

$$F(x, y) \quad \sin(xy) \quad \ln(y \quad x) \quad x \qquad k \quad \frac{F_x}{F_y} \quad \frac{y\cos(xy) \quad \frac{1}{y \quad x} \quad 1}{x\cos(xy) \quad \frac{1}{y \quad x}} \qquad (0,1) \qquad k \quad 1$$

$y \quad 1 \quad x \qquad y \quad x \quad 1$

40

$$y \quad f \ x \quad |x| \quad \begin{matrix} x & x \quad 0 \\ x & x \quad 0 \end{matrix}$$

$x_0 \quad 0$

$y \quad f \quad x \quad |x| \quad x_0 \quad 0 \qquad f \; 0 \quad 0$

$\lim_{x \quad 0} f \quad x \quad \lim_{x \quad 0} f \quad x \quad 0$

$\lim_{x \quad 0} f \quad x \quad \lim_{x \quad 0} x \quad 0$

$\lim_{x \quad 0} |x| \quad f \quad 0$

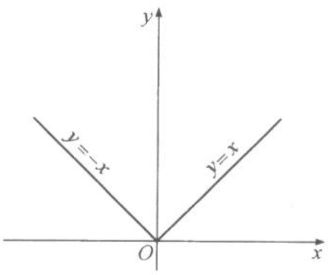
$x_0 \quad 0 \quad f \quad x$

$f \quad 0 \quad \lim_{x \quad 0} \frac{y}{x} \quad \lim_{x \quad 0} \frac{|0 \quad x| \quad 0}{x}$

$\lim_{x \quad 0} \frac{|\; x|}{x} \quad \lim_{x \quad 0} \frac{x}{x} \quad 1$

$f \quad 0 \quad \lim_{x \quad 0} \frac{y}{x} \quad \lim_{x \quad 0} \frac{|0 \quad x| \quad 0}{x}$

$\lim_{x \quad 0} \frac{|\; x|}{x} \quad \lim_{x \quad 0} \frac{x}{x} \quad 1$



$f \quad 0 \quad f \quad 0 \qquad y \quad |x|$

41

$f \quad x \quad \begin{matrix} x^2 & x \quad 1 \\ ax \quad b & x \quad 1 \end{matrix}$

$a \quad b \qquad f \quad x \qquad x \quad 1$

∵ $\qquad f \quad x \qquad x \quad 1$

$f \; 1 \; 0 \quad \lim_{x \; 1} f \quad x \quad \lim_{\alpha \; 1} x^2 \quad 1$

$f \quad x \qquad x \quad 1 \qquad a \quad b \quad 1 \quad b \quad 1 \quad a$

$f \quad 1 \quad \lim_{x \; 1} \frac{f \quad x \qquad f \; 1}{x \quad 1} \quad \lim_{x \; 1} \frac{x^2 \quad 1}{x \quad 1} \quad \lim_{x \; 1} x \quad 1 \quad 2$

$$f \quad 1 \quad \lim_{x \quad 1} \frac{f \quad x \qquad f \quad 1}{x \quad 1} \quad \lim_{x \quad 1} \frac{ax \quad b \quad 1}{x \quad 1} \quad \lim_{x \quad 1} \frac{a \quad x \quad 1}{x \quad 1} \quad a$$

$$f \quad x \qquad x \quad 1 \qquad\qquad f \quad 1 \quad f \quad 1 \qquad 2 \quad a$$

$$a \quad 2 \quad b \quad 1 \quad a \quad 1 \quad 2 \qquad 1 \qquad f \quad x \qquad x \quad 1$$

42

$$y \quad \sqrt{1 \quad x^2}\ln(x \quad \sqrt{1 \quad x^2}) \qquad\qquad y \quad \cot^2 x \quad \arccos\sqrt{1 \quad x^2}$$

$$y \qquad \sqrt{1 \quad x^2} \quad \ln \quad x \quad \sqrt{1 \quad x^2} \qquad \sqrt{1 \quad x^2} \quad \ln \quad x \quad \sqrt{1 \quad x^2}$$

$$\frac{x}{\sqrt{1 \quad x^2}}\ln \quad x \quad \sqrt{1 \quad x^2} \qquad \sqrt{1 \quad x^2} \quad \frac{1}{x \quad \sqrt{1 \quad x^2}} \square 1 \quad \frac{x}{\sqrt{1 \quad x^2}}$$

$$\frac{x}{\sqrt{1 \quad x^2}}\ln \quad x \quad \sqrt{1 \quad x^2} \qquad 1$$

$$y \qquad \cot^2 x \qquad \arccos\sqrt{1 \quad x^2}$$

$$2\cot x \csc^2 x \quad \frac{1}{\sqrt{1 \quad 1 \quad x^2}} \square \frac{(\quad x)}{\sqrt{1 \quad x^2}}$$

$$\frac{2\cos x}{\sin^3 x} \quad \frac{x}{|x|\sqrt{1 \quad x^2}}$$

43

$$y \quad e^{x^2}\sin\sqrt{x} \qquad\qquad\qquad y \quad \frac{\ln x \quad \cot x}{\sin x}$$

$$dy \quad \sin\sqrt{x}de^{x^2} \quad e^{x^2}d\sin\sqrt{x} \quad 2xe^{x^2}\sin\sqrt{x}dx \quad \frac{\cos\sqrt{x}}{2\sqrt{x}} \square e^{x^2}dx$$

$$e^{x^2} \quad 2x\sin\sqrt{x} \quad \frac{\cos\sqrt{x}}{2\sqrt{x}} \quad dx$$

$$dy \quad \frac{\sin x d(\ln x \quad \cot x) \quad (\ln x \quad \cot x)d\sin x}{(\sin x)^2}$$

$$\frac{1}{\sin x} \quad \frac{1}{x} \quad \csc^2 x \quad dx \quad \cos x(\ln x \quad \cot x)dx$$

$$\frac{1}{x\sin x} \quad \csc^3 x \quad \cos x\ln x \quad \cos x\cot x \quad dx$$

44 $\qquad f(x) \quad x(x \quad 1)(x \quad 2)\cdots(x \quad 100) \qquad f \ (50)$

$$g(\ x) \quad x(\ x \quad 1 \ ) \ (x \cdots \quad 2 \ ) \quad x \ (\qquad 4x9 \ ) \ (\qquad 5$$

$f(\ x) \quad (x \quad 5\ 0g)$

$f\ (\ x) \quad g(\ x) \quad (x \quad 5\ 0$

$$f\ (50) \quad g(50) \quad (50!)(\ 1)^{50}(50!) \quad (50!)^2$$

45 $\quad f(x) \qquad y \quad f(\ln x)e^{f(x)} \qquad dy$

$d\ y \quad (f\ln\ x)^{f(x)} d\ e \quad {}^{f(\ x)} e \quad ($

$f\ (x)e^{f(x)} f(\ln x)dx \quad \frac{1}{x} f\ (\ln x)e^{f(x)}dx$

$e^{f(x)} \quad f\ (x) f(\ln x) \quad \frac{1}{x} f\ (\ln x) \quad dx$

46 $\quad y \quad y(x) \qquad \arctan(x^2 \quad y^2) \quad ye^{\sqrt{x}} \qquad \frac{dy}{dx} \quad dy$

$x \qquad y \qquad x$

$$\frac{1}{1 \quad x^2 \quad y^2 \quad {}^2}(2x \quad 2yy\ ) \quad y\,e^{\sqrt{x}} \quad \frac{y}{2\sqrt{x}}e^{\sqrt{x}}$$

$$y \quad \frac{\frac{y}{2\sqrt{x}}e^{\sqrt{x}} \quad \frac{2x}{1 \quad x^2 \quad y^2 \quad {}^2}}{\frac{2y}{1 \quad x^2 \quad y^2 \quad {}^2} \quad e^{\sqrt{x}}} \quad \frac{ye^{\sqrt{x}}\ 1 \quad x^2 \quad y^2 \quad {}^2 \quad 4\sqrt{x}x}{4y\sqrt{x} \quad 2\sqrt{x}\ 1 \quad x^2 \quad y^2 \quad {}^2 \quad e^{\sqrt{x}}}$$

$$dy \quad \frac{ye^{\sqrt{x}}\ 1 \quad x^2 \quad y^2 \quad {}^2 \quad 4\sqrt{x}x}{4y\sqrt{x} \quad 2\sqrt{x}\ 1 \quad x^2 \quad y^2 \quad {}^2 \quad e^{\sqrt{x}}}dx$$

$d \ \arctan(x^2 \quad y^2) \quad d \ ye^{\sqrt{x}}$

$$\frac{1}{1 \quad x^2 \quad y^2 \quad {}^2}d\ x^2 \quad y^2 \quad e^{\sqrt{x}}dy \quad yde^{\sqrt{x}}$$

$$\frac{2}{1 \quad x^2 \quad y^2 \quad {}^2}\ xdx \quad ydy \quad e^{\sqrt{x}}dy \quad \frac{y}{2\sqrt{x}}e^{\sqrt{x}}dx$$

$$\frac{2y}{1 \quad x^2 \quad y^2 \quad {}^2} \quad e^{\sqrt{x}} \quad dy \quad \frac{y}{2\sqrt{x}}e^{\sqrt{x}} \quad \frac{2x}{1 \quad x^2 \quad y^2 \quad {}^2} \quad dx$$

$$\frac{4y\sqrt{x} \quad 2\sqrt{x}\ 1 \quad x^2 \quad y^2\ {}^2 \quad e^{\sqrt{x}}}{2\sqrt{x}\ 1 \quad x^2 \quad y^2\ {}^2} dy \qquad \frac{ye^{\sqrt{x}}\ 1 \quad x^2 \quad y^2\ {}^2 \quad 4\sqrt{x}x}{2\sqrt{x}\ 1 \quad x^2 \quad y^2\ {}^2} dx$$

$$dy \quad \frac{ye^{\sqrt{x}}\ 1 \quad x^2 \quad y^2\ {}^2 \quad 4\sqrt{x}x}{4y\sqrt{x} \quad 2\sqrt{x}\ 1 \quad x^2 \quad y^2\ {}^2 \quad e^{\sqrt{x}}} dx$$

47 $\quad y \quad \sqrt[3]{\frac{x(x \quad 1)(x \quad 2)}{(x^2 \quad 1)(e^x \quad x)}} \qquad y$

$\ln y \quad \frac{1}{3} \quad \ln x \quad \ln(x \quad 1) \quad \ln(x \quad 2) \quad \ln(e^x \quad x)$

$$\frac{1}{y} y \quad \frac{1}{3} \; \frac{1}{x} \quad \frac{1}{x \quad 1} \quad \frac{1}{x \quad 2} \quad \frac{2x}{x^2 \quad 1} \quad \frac{e^x \quad 1}{e^x \quad x}$$

$$y \quad \frac{1}{3}\sqrt[3]{\frac{x(x \quad 1)(x \quad 2)}{(x^2 \quad 1)(e^x \quad x)}} \; \frac{1}{x} \quad \frac{1}{x \quad 1} \quad \frac{1}{x \quad 2} \quad \frac{2x}{x^2 \quad 1} \quad \frac{e^x \quad 1}{e^x \quad x}$$

48 $\quad \begin{cases} x = \ln(1+t^3) \\ y = t^2 \sin t \end{cases} \qquad \frac{dy}{dx}.$

$$\frac{dy}{dx} = \frac{\frac{dy}{dt}}{\frac{dx}{dt}} = \frac{2t\sin t + t^2\cos t}{\frac{3t^2}{1+t^3}}$$

$$= \frac{\left(1+t^3\right)\left(2t\sin t + t^2\cos t\right)}{3t^2} = \frac{\left(1+t^3\right)\left(2\sin t + t\cos t\right)}{3t}$$

49 $\quad y \quad \frac{1}{x}(x \quad 0)$ 了 $\quad x_0, \frac{1}{x_0}$ 四

$$y \quad \frac{1}{x_0} \quad \frac{1}{x_0^2} \; x \quad x_0$$

$y \quad 0 \qquad\qquad X \quad 2x_0$

$x \quad 0 \qquad\qquad Y \quad \frac{2}{x_0}$

$$S \quad \frac{1}{2}XY \quad \frac{1}{2}(2x_0) \quad \frac{2}{x_0} \qquad 2$$

50 $\begin{cases} x = 1+ t^2 \\ y = t^3 \end{cases}$ $t = 2$.

$x_0 \quad 1 \quad 2^2 \quad 5 \quad y_0 \quad 2^3 \quad 8 \quad \frac{dy}{dx} = \frac{3t^2}{2t} = \frac{3}{2}t$

$\left.\frac{dy}{dx}\right|_{t=2} = 3$ $\qquad y - 8 = 3(x - 5)$

$3x - y - 7 = 0$

51 y=y(x) $\begin{cases} x \quad t^2 \quad 2t, \\ y \quad \ln(1 \quad t) \end{cases}$ y=y(x) x=3 x 四

(A) $\frac{1}{8}\ln 2 \quad 3.$ (B) $\frac{1}{8}\ln 2 \quad 3.$

(C) $8\ln 2 \quad 3.$ (D) $8\ln 2 \quad 3.$ [A]

x=3 $t^2 \quad 2t \quad 3 \qquad t \quad 1, t \quad 3$ y

$\left.\frac{dy}{dx}\right|_{t\ 1} \quad \left.\frac{\frac{1}{1 \quad t}}{2t \quad 2}\right|_{t\ 1} \quad \frac{1}{8}$ x=3(y=ln2)

$y \quad \ln 2 \quad 8(x \quad 3)$

y=0, x 四 $\frac{1}{8}\ln 2 \quad 3,$ (A).

52 $y(x)$ $\begin{cases} x \quad t^3 \quad 3t \quad 1 \\ y \quad t^3 \quad 3t \quad 1 \end{cases}$, $y \quad y(x)$ x

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$\begin{cases} x \quad x(t) \\ y \quad y(t) \end{cases}$

$\frac{d^2y}{dx^2} \quad \frac{y\ (t)x\ (t) \quad x\ (t)y\ (t)}{(x\ (t))^3}$ 内 $\frac{d^2y}{dx^2} \quad 0$ x .

$$\frac{dy}{dx} \quad \frac{\frac{dy}{dt}}{\frac{dx}{dt}} \quad \frac{3t^2 \quad 3}{3t^2 \quad 3} \quad \frac{t^2 \quad 1}{t^2 \quad 1} \quad 1 \quad \frac{2}{t^2 \quad 1},$$

$$\frac{d^2y}{dx^2} \quad \frac{d}{dt}\frac{dy}{dx}\frac{dt}{dx} 1 \quad \frac{2}{t^2 \quad 1} \quad \frac{1}{3(t^2 \quad 1)} \quad \frac{4 \quad t}{3(t^2},$$

$\frac{d^2y}{dx^2} \quad 0 \qquad t \quad 0.$

$x \quad t^3 \quad 3t \quad 1$, $t \quad 0$, $x \quad (\quad ,1)$ $(\because t \quad 0 \quad x \quad 1 \quad x \quad (\quad ,1]$.)

53 $f \quad x \quad 0 \quad 3 \quad 0 \quad 3 \quad f \quad 0 \quad f \quad 1 \quad f \quad 2 \quad 3 \quad f \quad 3 \quad 1$

$0 \quad 3 \quad f \quad 0$

$\because f(x) \quad 0 \quad 3 \quad f(x) \quad 0 \quad 2 \quad M \quad m \quad m \quad f(0) \quad M$

$m \quad f(1) \quad M \quad m \quad f(2) \quad M \quad m \quad \frac{1}{3} \quad f(0) \quad f(1) \quad f(2) \quad M$

$c \quad 0 \quad 2$

$f \quad c \quad \frac{1}{3} \quad f(0) \quad f(1) \quad f(2) \quad 1$

$f \quad c \quad f \quad 3 \quad f \quad x$ c 3 c 3 内 c 3 0 3

$f \quad 0$

54 $f \quad x \quad 0 \quad 1 \quad 0\,1 \quad 3\int_{\frac{2}{3}}^{1} f \quad x \quad dx \quad f \quad 0$

$x \quad (\quad) \quad f \ (x) = 0$

$$\int_{\frac{2}{3}}^{1} f \quad x \quad dx \quad f \quad c \quad 1 \quad \frac{2}{3}$$

$f \quad c \quad 3\int_{\frac{2}{3}}^{1} f \quad x \quad d\,x($

$f \quad x \quad 0 \quad c$

$x \quad (0 \quad c) \quad (0\,1) \quad f \ (x) = 0$

55 $x > 0 \quad \frac{x}{1+x} < \ln(1+x) < x$

$f(t) = \ln(1+t) \quad [0, x]$

$f \ (t) = \frac{1}{1+t} \quad \ln(1+x) - \ln 1 = \frac{1}{1+x}[x - 0] \quad (0 < x < x)$

$\ln(1+x) = \frac{x}{1+x} \quad (0 < x < x$

$\frac{x}{1+x} < \ln(1+x) < x)$

56 $f \quad x \quad a \quad b \quad a \quad b \quad f \quad a \quad f \quad b \quad a \quad b$

$f \quad 0$

$c \quad (a,b) \qquad f \ c \quad f \ a \quad f \ b$

复 $f \ c \quad f \ a \qquad f \ x \quad a \quad c \qquad x_1 \quad (a,c) \qquad f \quad {}_1 \quad \frac{f(c) \quad f(a)}{c \quad a} \quad 0$

复 $f \ b \quad f \ c \qquad f \ x \quad c \quad b \qquad x_2 \quad (c,b) \qquad f \quad {}_2 \quad \frac{f(b) \quad f(c)}{b \quad c} \quad 0$

$x \quad (a,b) \qquad f \qquad 0$

57 $f \ (x) \quad 0 \quad f(0) = 0$ 了 $x_1 > 0 \quad x_2 > 0$

$f(x_1 + x_2) < f(x_1) + f(x_2)$

$x_1 \quad x_2$

$f(x_1) = f(x_1) - f(0) = (x_1 - 0) f \ (x_1) \qquad 0 < x_1 < x_1$

$f(x_1 + x_2) - f(x_2) = [(x_1 + x_2) - x_2] f \ (x_2) \quad x_2 < x_2 < x_1 + x_2 \qquad x_1 < x_2$

$f \ (x) < 0 \qquad f \ (x) \qquad f \ (x_1) > f \ (x_2)$

$$f(x_1) > f(x_1 + x_2) - f(x_2)$$

$f(x_1 + x_2) < f(x_1) + f(x_2)$

58 $f \ x \quad a \quad b \qquad a \quad b \qquad b \quad a \quad 0 \qquad x \quad (a,b) \quad h \quad (a,b)$

$f \ (h) = \frac{a+b}{2} g \frac{f \ (x)}{x}$

$g \ x$

$$\frac{f \ (x)}{g \ (x)} = \frac{f(b) - f(a)}{g(b) - g(a)} = \frac{f \ (h)(b-a)}{g(b) - g(a)}$$

$$\frac{f \ (x)}{2x} = \frac{f \ (h)}{a+b} = \frac{f \ (h)(b-a)}{b^2 - a^2}$$

内 $g(x) = x^2$

$f \ (h) = \frac{b^2 + ab + a^2}{3} g \frac{f \ (x)}{x^2} \qquad g(x) = x^3$

59 $f \ x \quad 0 \, 1 \qquad f \ 0 \quad f \ 0 \quad f \ 1 \quad 0 \quad f \ 1 \quad 1$

x ( ) $|f(x)|$ 4

f x $x=0$ 令

f x f 0 f 0 x $\frac{1}{2!}f$ ${}_1$ x^2 (0 ${}_1$ x

f x $x=1$ 令

f x f 1 f 1 x 1 $\frac{1}{2!}f$ ${}_2$ x 1^2 (x ${}_2$ 1

$x=\frac{1}{2}$

f $\frac{1}{2}$ $\frac{1}{8}f$ ${}_1$ (0 ${}_1$ $\frac{1}{2}$

f $\frac{1}{2}$ 1 $\frac{1}{8}f$ ${}_2$ ($\frac{1}{2}$ ${}_2$ 1

f ${}_1$ f ${}_2$ 8 $|f(x_1)|+|f(x_2)|$? 8

$\max\{|f(x_1)|,|f(x_2)|\}$ 4

x ( ) $|f(x)|$ 4

60 0,1 f x 0 f 0 f 1 f 1 f 0 f 0 f 1

A f 1 f 0 f 1 f 0 B f 1 f 1 f 0 f 0

C f 1 f 0 f 1 f 0 D f 1 f 0 f 1 f 0

B

f 1 f 0 f 1 0 f

0 1 f x 0 f x 别

f 1 f( ) f

61 $f(x)$ a,b a,b $f(a)$ 0 复 $f(x)$ 别 (x) $\frac{f\ \ x}{x\ \ a}$

a,b 别

(x) $\frac{x\ \ a\ \ f\ \ x\ \ \ f\ \ x}{x\ \ a^{\ 2}}$

$f(x)$ $f(x)$ $f(a)$ f ( )(x a) (a x)

$$(x) \quad \frac{f \quad x \quad f}{x \quad a}$$

$f \quad x$ 别 $f \quad x \quad f$

$x \quad 0 \quad x \quad a,b$ 别

62 $f(x) \quad (\quad , \quad)$

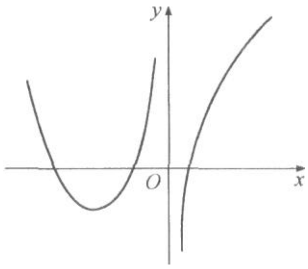
复 $f(x)$

A

B

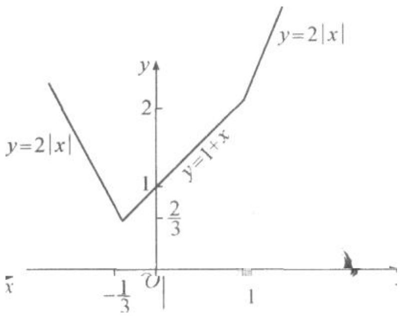
C

D



63 $f(x) \quad \max \quad 2|x|,|1 \quad x|$

$$f(x) \quad \begin{matrix} 1 \quad x & \frac{1}{3} \quad x \quad 1 \\ 2|x| & x \quad 1 \quad x \quad \frac{1}{3} \end{matrix}$$



$f\quad \frac{1}{3} = \frac{2}{3}$

64 $f(x)$ x_0

$\lim_{\substack{x \to x_0 \\ n}} \frac{f(x) \quad f(x_0)}{(\quad _0)^n}$ k n k 0 n $f(x_0)$

$\lim_{x \to x_0} a(x) = 0$

00( ) ( )00

$f(x) - f(x_0) = k(x - x_0)^n + a(x)(x - x_0)^n$

n $|x - x_0| < d$

$f(x) - f(x_0)$ k k 0 $f(x_0)$ k 0 $f(x_0)$

n $|x - x_0| < d$ $f(x) - f(x_0)$ x_0 $f(x_0)$

65 $f\ x \quad \int_0^1 |t \ t \quad x|dt \quad 0 \quad x \quad 1$ $f\ x$.

$f(x) \quad \int_0^x t(x \quad t)dt \quad \int_x^1 t(t \quad x)dt \quad \int_0^x (tx \quad t^2)dt \quad \int_x^1 (t^2 \quad tx)dt$

$(x \frac{t^2}{2} \quad \frac{t^3}{3})\Big|_0^x \quad (\frac{t^3}{3} \quad x \frac{t^2}{2})\Big|_x^1 \quad (\frac{x^3}{2} \quad \frac{x^3}{3}) \quad (\frac{1}{3} \quad \frac{x}{2}) \quad (\frac{x^3}{3} \quad \frac{x^3}{2})$

$\frac{x^3}{6} \quad \frac{1}{3} \quad \frac{x}{2} \quad \frac{x^3}{6} \quad \frac{x^3}{3} \quad \frac{x}{2} \quad \frac{1}{3}.$

$f\ (x) \quad x^2 \quad \frac{1}{2}$, $f\ (x) \quad 0$ $x \quad \frac{\sqrt{2}}{2}.$ $0 \quad x \quad 1$ $x \quad \frac{\sqrt{2}}{2}.$

$f\ (x) \quad 0$ $\frac{\sqrt{2}}{2} \quad x \quad 1$

$f\ (x) \quad 0$ $0 \quad x \quad \frac{\sqrt{2}}{2}$

$f(x)$ $(\frac{\sqrt{2}}{2},1)$ $(0,\frac{\sqrt{2}}{2}).$

$f\ (x) \quad 2x$ $(0,1)$.

$f\ (\frac{\sqrt{2}}{2}) \quad 0, f\ (\frac{\sqrt{2}}{2}) \quad 0,$ $f(\frac{\sqrt{2}}{2}) \quad \frac{\sqrt{2}}{6} \quad \frac{1}{3}$.

$$y \quad e^{x\ln(1\sin x)} \quad [\ln(1 \quad \sin x) \quad x \frac{\cos x}{1 \quad \sin x}]$$

$$dy\Big|_{x} = y(\quad)dx \qquad dx.$$

$$\ln y \quad x\ln(1 \quad \sin x) \qquad x$$

$$\frac{1}{y}y \quad \ln(1 \quad \sin x) \quad \frac{x\cos x}{1 \quad \sin x}$$

$$y \quad (1 \quad \sin x)^{x} \quad [\ln(1 \quad \sin x) \quad x \frac{\cos x}{1 \quad \sin x}]$$

$$dy\Big|_{x} = y(\quad)dx \qquad dx.$$

67 $y \quad \frac{(1 \quad x)^{\frac{3}{2}}}{\sqrt{x}}$ ____________

.

$$a=\lim_{x} \frac{f(x)}{x} \quad \lim_{x} \frac{(1 \quad x)^{\frac{3}{2}}}{x\sqrt{x}} \quad 1,$$

$$b \quad \lim_{x} f(x) \quad ax \quad \lim_{x} \frac{(1 \quad x)^{\frac{3}{2}} \quad x^{\frac{3}{2}}}{\sqrt{x}} \quad \frac{3}{2}$$

$$y \quad x \quad \frac{3}{2}.$$

复 1

2 x $a \quad \lim_{x} \frac{f(x)}{x}$ x x

x>0 x .

68 $x \quad 0 \quad (x) \quad kx^2 \quad (x) \quad \sqrt{1 \quad x\arcsin x} \quad \sqrt{\cos x}$ k= ________

$$\lim_{x \quad 0} \frac{(x)}{(x)} \quad 1 \qquad k \quad .$$

$$\lim_{x \quad 0} \frac{(x)}{(x)} \quad \lim_{x \quad 0} \frac{\sqrt{1 \quad x\arcsin x} \quad \sqrt{\cos x}}{kx^2}$$

$$=\lim_{x \quad 0} \frac{x\arcsin x \quad 1 \quad \cos x}{kx^2(\sqrt{1 \quad x\arcsin x} \quad \sqrt{\cos x})}$$

$$=\frac{1}{2k}\lim_{x \quad 0} \frac{x\arcsin x \quad 1 \quad \cos x}{x^2} \quad \frac{3}{4k} \quad 1 \qquad k \quad \frac{3}{4}.$$

务 .

69 $f(x) \quad \lim_{n} \sqrt[n]{1 \quad |x|^{3n}}$ f(x) (,)

(A) . (B) .

(C) . (D) . [ ]

内 f(x) .

$$|x| \quad 1 \qquad f(x) \quad \lim_{n} \sqrt[n]{1 \quad |x|^{3n}} \quad 1$$

$|x|\quad 1 \qquad f(x)\quad \lim_{n}\sqrt[n]{1\quad 1}\quad 1$

$|x|\quad 1 \qquad f(x)\quad \lim_{n}|x|^3(\frac{1}{|x|^{3n}}\quad 1)^{\frac{1}{n}}\quad |x|^3.$

$$f(x)\quad \begin{matrix} x^3, & x\quad 1, \\ 1, & 1\quad x\quad 1, \\ x^3, & x\quad 1. \end{matrix}$$

f(x)乐 x= 1 (C).

.

70 $f(x)\quad \frac{1}{e^{\frac{x}{x\ 1}}\quad 1},$

(A) x=0,x=1 f(x) .

B x=0,x=1 f(x) .

(C) x=0 f(x) x=1 f(x) .

(D) x=0 f(x) x=1 f(x) . [ ]

x=0,x=1 .

f(x) x=0,x=1 .

$\lim_{x\quad 0} f(x)$ x=0

$\lim_{x\quad 1} f(x)\quad 0\quad \lim_{x\quad 1} f(x)\quad 1$ x=1 (D).

$$\lim_{x\quad 1}\frac{x}{x\quad 1}\qquad \lim_{x\quad 1}\frac{x}{x\quad 1}\quad .\quad \lim_{x\quad 1}e^{\frac{x}{x\ 1}}\qquad \lim_{x\quad 1}e^{\frac{x}{x\ 1}}\quad 0.$$

71 $x\quad 0\quad (1\quad ax^2)^{\frac{1}{4}}\quad 1\quad x\sin x$ a=____________.

$$\lim_{x\quad 0}\frac{(1\quad ax^2)^{\frac{1}{4}}}{x\sin x}\quad 1$$

y=f(x) x=0 n $f^{(n)}(0)$ x^n

____

$y \quad 2^x \ln 2$ $\cdots, y^{(x)} \quad 2^x (\ln 2)^n$

$y^{(n)}(0) \quad (\ln 2)^n$ x^n $\dfrac{y^{(n)}(0)}{n!} \quad \dfrac{(\ln 2)^n}{n!}$.

74 $\{a_n\},\{b_n\},\{c_n\}$ $\lim\limits_{n} a_n \quad 0, \lim\limits_{n} b_n \quad 1, \lim\limits_{n} c_n$,

(A) $a_n \quad b_n$ 了 n . (B) $b_n \quad c_n$ 了 n .

(C) $\lim\limits_{n} a_n c_n$. (D) $\lim\limits_{n} b_n c_n$. [ ]

(A),(B) $\lim\limits_{n} a_n c_n \quad 0$

$\lim\limits_{n} b_n c_n \quad 1$.

$a_n \quad \dfrac{2}{n} \quad b_n \quad 1$

$$=4\lim_{x\quad 0}\frac{e^{ax}\quad x^2\quad ax\quad 1}{x^2}\quad 4\lim_{x\quad 0}\frac{ae^{ax}\quad 2x\quad a}{2x}\quad 2a^2\quad 4.$$

$f(0\quad 0)\quad f(0\quad 0)\qquad 6a\quad 2a^2\quad 4\qquad a\quad 1\quad a\quad 2.$

a=-1 $\lim_{x\quad 0}f(x)\quad 6\quad f(0)$ f(x) x=0 .

a=-2 $\lim_{x\quad 0}f(x)\quad 12\quad f(0)$ x=0 f(x) .

务.

76 y=y(x) $\begin{matrix} x\quad 1\quad 2t^2, \\ y\quad \int_1^{1\quad 2\ln t}\frac{e^u}{u}du \end{matrix}(t\quad 1)$ $\left.\frac{d^2y}{dx^2}\right|_{x\quad 9}.$

. x=9 t

.

$$\frac{dy}{dt}\quad\frac{e^{1\quad 2\ln t}}{1\quad 2\ln t}\ \frac{2}{t}\quad\frac{2et}{1\quad 2\ln t}\quad\frac{dx}{dt}\quad 4t$$

$$\frac{dy}{dx}\quad\frac{\frac{dy}{dt}}{\frac{dx}{dt}}\quad\frac{\frac{2et}{1\quad 2\ln t}}{4t}\quad\frac{e}{2(1\quad 2\ln t)},$$

$$\frac{d^2y}{dx^2}\quad\frac{d}{dt}\left(\frac{dy}{dx}\right)\frac{1}{\frac{dx}{dt}}=\frac{e}{2}\ \frac{1}{(1\quad 2\ln t)^2}\ \frac{2}{t}\ \frac{1}{4t}$$

$$=\quad\frac{e}{4t^2(1\quad 2\ln t)^2}.$$

x=9 $x\quad 1\quad 2t^2$单 t>1 t=2,

$$\left.\frac{d^2y}{dx^2}\right|_{x\quad 9}\quad\left.\frac{e}{4t^2(1\quad 2\ln t)^2}\right|_{t\quad 2}\quad\frac{e}{16(1\quad 2\ln 2)^2}.$$

77 $f(x)\quad\lim_{n}\frac{(n\quad 1)x}{nx^2\quad 1},\quad f(x)\qquad x$ ___ .

x 内 $f(x)$,

$f(x)$

$x\quad 0\qquad f(x)\quad 0$

$$x\quad 0\qquad f(x)\quad\lim_{n}\frac{(n\quad 1)x}{nx^2\quad 1}\quad\lim_{n}\frac{(1\quad\frac{1}{n})x}{x^2\quad\frac{1}{n}}\quad\frac{x}{x^2}\quad\frac{1}{x}$$

$$f(x) \quad \begin{cases} 0, & x \quad (\\ \frac{1}{x}, & x \quad 0 \end{cases},$$

$$\lim_{x \quad 0} f(x) \quad \lim_{x \quad 0} \frac{1}{x} \qquad f(0)$$

$x \quad 0 \quad f(x)$.

78 $y(x)$ $\begin{cases} x \quad t^3 \quad 3t \quad 1 \\ y \quad t^3 \quad 3t \quad 1 \end{cases}$, $y \quad y(x)$ x

---

$\begin{cases} x \quad x(t) \\ y \quad y(t) \end{cases}$

$$\frac{d^2y}{dx^2} \quad \frac{y\ (t)x\ (t) \quad x\ (t)y\ (t)}{(x\ (t))^3}$$ 内 $\frac{d^2y}{dx^2} \quad 0 \quad x$.

$$\frac{dy}{dx} \quad \frac{\frac{dy}{dt}}{\frac{dx}{dt}} \quad \frac{3t^2 \quad 3}{3t^2 \quad 3} \quad \frac{t^2 \quad 1}{t^2 \quad 1} \quad 1 \quad \frac{2}{t^2 \quad 1},$$

$$\frac{d^2y}{dx^2} \quad \frac{d}{dt} \frac{dy}{dx} \frac{dt}{dx} 1 \quad \frac{2}{t^2 \quad 1} \quad \frac{1}{3(t^2 \quad 1)} \quad \frac{4 \quad t}{3(t},$$

$\frac{d^2y}{dx^2} \quad 0 \qquad t \quad 0.$

$x \quad t^3 \quad 3t \quad 1$, $t \quad 0$, $x \quad (\quad ,1)$ $(\because t \quad 0 \quad x \quad 1 \quad x \quad (\quad ,1]$.)

79 $x \quad 0$ $\int_0^x \cos t^2 dt$, $\int_0^{x^2} \tan\sqrt{t}\, dt$, $\int_0^{\sqrt{x}} \sin t^3 dt$,

,

A , , . B , , .

C , , . D , , .

域

$$\because \lim_{x \quad 0} — \quad \lim_{x \quad 0} \frac{\int_0^{\sqrt{x}} \sin t^3 dt}{\int_0^x \cos t^2 dt}$$

$$\lim_{x \quad 0} \frac{\sin x^{\frac{3}{2}} \frac{1}{2\sqrt{x}}}{\cos x^2}$$

$$\lim_{x \quad 0} \frac{x^{\frac{3}{2}}}{2\sqrt{x}} \quad \lim_{x \quad 0} \frac{x}{2} \quad 0$$

o( )

$$\lim_{x\ 0} — \quad \lim_{x\ 0}\frac{\int_0^{x^2}\tan\sqrt{t}dt}{\int_0^{\sqrt{x}}\sin t^3 dt} \quad \lim_{x\ 0}\frac{\tan x\ \ 2x}{\sin x^{\frac{3}{2}}\ \ \frac{1}{2\sqrt{x}}} \quad \lim_{x\ 0}\frac{2x^2}{\frac{1}{2}x} \quad 0$$

o( )

, B .

80 $f(x)\ \ |x(1\ \ x)|$,

A $x\ \ 0$ $f(x)$, $(0,0)$ $y\ \ f(x)$.

B $x\ \ 0$ $f(x)$, $(0,0)$ $y\ \ f(x)$.

C $x\ \ 0$ $f(x)$, $(0,0)$ $y\ \ f(x)$.

D $x\ \ 0$ $f(x)$, $(0,0)$ $y\ \ f(x)$.

$x\ \ 0$ $f\ (x)$, $f\ \ (x)$.

$$f(x)\ \ \begin{matrix} x(1\ \ x), & 1\ \ x\ \ 0 \\ x(1\ \ x), & 0\ \ x\ \ 1 \end{matrix}$$

$$f\ (x)\ \ \begin{matrix} 1\ \ 2x, & 1\ \ x\ \ 0 \\ 1\ \ 2x, & 0\ \ x\ \ 1 \end{matrix}$$

$$f\ \ (x)\ \ \begin{matrix} 2\ , & 1\ \ x \\ 2\ , & 0\ \ x \end{matrix}$$

$1\ \ x\ \ 0$, $f(x)$, $1\ \ x\ \ 0$, $f(x)$, $(0,0)$.

$f(0)\ \ 0$, $x\ \ 0\ 1$, $f(x)\ \ 0$, $x\ \ 0$.

, $x\ \ 0$, $(0,0)$ $y\ \ f(x)$, C .

81 $f(x)$, $f\ (0)\ \ 0$, 0,

A $f(x)$ $(0,\ )$ 别.

B $f(x)$ $(\ \ ,0)$.

C 了 $x\ \ (0,\ )$ $f(x)\ \ f(0)$.

D 了 $x\ \ (\ \ ,0)$ $f(x)\ \ f(0)$. ( )

单 $f(x)\ \ x\ \ 0$

$$f\ (0)\quad \lim_{x\quad 0}\frac{f(x)\quad f(0)}{x\quad 0}\quad 0,$$

, 0, $|x|$,

$$\frac{f(x)\quad f(0)}{x}\ 0$$

$x\quad 0$, $f(x)\quad f(0)$

$x\quad 0$, $f(x)\quad f(0)$,

C .

82 $\lim_{x\quad 0}\frac{1}{x^3}\quad\frac{2\quad\cos x}{3}^{x}\quad 1$.

$\frac{0}{0}$ 域

$$\lim_{x\quad 0}\frac{e^{x\ln\frac{2\ \cos x}{3}}\quad 1}{x^3}$$

$$\lim_{x\quad 0}\frac{\ln\frac{2\quad\cos x}{3}}{x^2}$$

$$\lim_{x\quad 0}\frac{\ln\ 2\quad\cos x\quad 1}{x^2}$$

$$\lim_{x\quad 0}\frac{\frac{1}{2\quad\cos x}\quad\sin x}{2x}$$

$$\frac{1}{2}\lim_{x\quad 0}\frac{1}{2\quad\cos x}\ \frac{\sin x}{x}\quad -$$

$$\lim_{x\quad 0}\frac{e^{x\ln\frac{2\ \cos x}{3}}\quad 1}{x^3}$$

$$\lim_{x\quad 0}\frac{\ln\frac{2\quad\cos x}{3}}{x^2}$$

$$\lim_{x\quad 0}\frac{\ln\quad\frac{\cos x\quad 1}{3}}{x^2}$$

$$\lim_{x\quad 0}\frac{\cos x\quad 1}{3x^2}\quad\frac{}{6}$$

83 $f(x)$, , $[0,2]$, $f(x)\quad x(x^2\quad 4)$, 了 x

$f(x)\quad k f(x\quad 2)$, k .

$2 \quad x \quad 0 \qquad 0 \quad x \quad 2 \quad 2$

$f(x) \quad kf(x \quad 2) \quad k(x \quad 2)[(x \quad 2)^2 \quad 4] \quad kx(x \quad 2)(x \quad 4)$.

$f(0) \quad 0$.

$$f\ (0) \quad \lim_{x \quad 0} \frac{f(x) \quad f(0)}{x \quad 0} \quad \lim_{x \quad 0} \frac{x(x^2 \quad 4)}{x} \quad 4$$

$$f\ (0) \quad \lim_{x \quad 0} \frac{f(x) \quad f(0)}{x \quad 0} \quad \lim_{x \quad 0} \frac{kx(x \quad 2)(x \quad 4)}{x} \quad 8k.$$

$f\ (0) \quad f\ (0)$, $\quad k \quad \frac{1}{2}$.

$k \quad \frac{1}{2}$, $f(x) \quad x \quad 0$.

84 $\quad e \quad a \quad b \quad e^2$, $\quad \ln^2 b \quad \ln^2 a \quad \frac{4}{e^2}(b \quad a)$.

$$(x) \quad \ln^2 x \quad \frac{4}{e^2} x,$$

$$(x) \quad 2\frac{\ln x}{x} \quad \frac{4}{e^2}$$

$$(x) \quad 2\frac{1 \quad \ln x}{x^2},$$

$x \quad e$, $\quad (x) \quad 0$, $\quad (x)$, $\quad e \quad x \quad e^2$,

$$(x) \qquad (e^2) \quad \frac{4}{e^2} \quad \frac{4}{e^2} \quad 0,$$

$e \quad x \quad e^2$, $\quad (x)$ 别.

, $\quad e \quad a \quad b \quad e^2$, $\quad (b) \quad (a)$,

$$\ln^2 b \quad \frac{4}{e^2} b \quad \ln^2 a \quad \frac{4}{e^2} a$$

$$\ln^2 b \quad \ln^2 a \quad \frac{4}{e^2}(b \quad a).$$

$$(x) \quad \ln^2 x \quad \ln^2 a \quad \frac{4}{e^2}(x \quad a),$$

$$(x) \quad 2\frac{\ln x}{x} \quad \frac{4}{e^2}$$

$$(x) \quad 2\frac{1 \quad \ln x}{x^2},$$

$x \quad e$, $\quad (x) \quad 0 \qquad (x)$, $\quad e \quad x \quad e^2$,

$$(x) \quad (e^2) \quad \frac{4}{e^2} \quad \frac{4}{e^2} \quad 0,$$

$e \quad x \quad e^2$, (x) 别.

$e \quad a \quad b \quad e^2$, $(x) \quad (a) \quad 0 \quad x \quad b \quad (b) \quad 0$

$$\ln^2 b \quad \ln^2 a \quad \frac{4}{e^2}(b \quad a).$$

$$\ln^2 x \quad [a, b] \quad ,$$

$$\ln^2 b \quad \ln^2 a \quad \frac{2\ln}{}(b \quad a), \; a \quad b.$$

$$(t) \quad \frac{\ln t}{t}, \qquad (t) \quad \frac{1 \quad \ln t}{t^2},$$

$t \quad e$, $(t) \quad 0,$ (t) ,

$(\ ) \quad (e^2),$

$$\frac{\ln}{} \quad \frac{\ln e^2}{e^2} \quad \frac{2}{e^2},$$

$$\ln^2 b \quad \ln^2 a \quad \frac{4}{e^2}(b \quad a)$$

85 $y \quad \dfrac{x \quad 4\sin x}{5x \quad 2\cos x}$ ____________

$$\because \lim_{x} y \quad \lim_{x} \frac{1 \quad \dfrac{4\sin x}{x}}{5 \quad \dfrac{2\cos x}{x}} \quad \frac{1}{5}$$

86 $f(x) \begin{cases} \dfrac{1}{x^3} \displaystyle\int_0^x \sin t^2 dt, & x \quad 0 \\ a, & x \quad 0 \end{cases}$ x=0 a=__________

$$\because \lim_{x \quad 0} f(x) \quad \lim_{x \quad 0} \frac{sm(x^2)}{3x^2} \quad \frac{1}{3}$$

87 $y \quad y(x)$ $y \quad 1 \quad xe^y$ $\left.\dfrac{dy}{dx}\right|_{x \; 0}$ ____________

x=0 y=1

$$x \qquad y \qquad e^y \quad xe^y y$$

$y(1 \quad xe^y) \quad e^y \qquad y\Big|_{x\,0} \quad \dfrac{e^y}{1 \quad xe^y}\Bigg|_{\substack{x\,0\\ y\,1}} \quad e$

88 $y \quad f(x)$ $f(x) \quad 0, \ f \ (x) \quad 0, \quad x$ x x_0

$y \quad dy$ $f(x)$ x_0 , $x \quad 0$

A $0 \quad dy \quad y$ B $0 \quad y \quad dy$

C $y \quad dy \quad 0$ D $dy \quad y \quad 0$

$f\ (x) \quad 0$ $f(x)$ 别

$f\ \ (x) \quad 0$ $f(x)$

89 $g(x)$ $, h(x) \quad e^{1 \ g(x)}, h\ (1) \quad 1, g\ (1) \quad 2,$ $g(1)$

A $\ln 3 \quad 1$ B $\ln 3 \quad 1$

C $\ln 2 \quad 1$ D $\ln 2 \quad 1$

$h\ (x) \quad g\ (x)e^{1 \ g(x)} \quad 1 \quad 2e^{1 \ g(1)}$

90 A B C $e^x(1 \quad Bx \quad Cx^2) \quad 1 \quad Ax \quad o(x^3)$ $o(x^3)$ $x \quad 0$ x^3 .

$1 \qquad \frac{\ ^2}{\ } \quad \frac{\ ^3}{\ } \quad (\ ^3)$

$[1 \quad x \quad \dfrac{x^2}{2} \quad \dfrac{x^3}{6} \quad o(x^3)][1 \quad Bx \quad Cx^2] \quad 1 \quad Ax \quad o(x^3)$

$1 \quad (B \quad 1)x \quad (C \quad B \quad \dfrac{1}{2})x^2 \quad \dfrac{B}{2} \quad C \quad \dfrac{1}{6} \quad o(x^3) \quad 1 \quad Ax \quad o(x^3)$

$B+1=A$

$C+B+\dfrac{1}{2}=0$

$\dfrac{B}{2} \quad C \quad \dfrac{1}{6} \quad 0$

- $\dfrac{B}{2} \quad \dfrac{1}{3} \quad 0 \quad B \quad \dfrac{2}{3}$

$A \quad \dfrac{1}{3}$

$C \quad \dfrac{1}{6}$

91 $\{x_n\}$ 0 x_1 $x_{n\ 1}$ $\sin x_n (n \quad 1,2,3,\cdots)$

1 $\lim\limits_{n} x_{n\ 1}$

2 $\lim\limits_{n} \left(\frac{x_{n\ 1}}{x_n}\right)^{\frac{1}{x_n^2}}$

1 $\because x_2 \quad \sin x_1, \quad 0 \quad x_2 \quad 1, \quad n \quad 2$

$x_{n\ 1} \quad \sin x_n \quad x_n, \{x_n\}$ $\because \quad x_n \quad 0$

1 $\lim\limits_{n} x_n \quad A$

$x_{n\ 1} \quad \sin x_n$ $A \quad \sin A \quad A \quad 0$

$\lim\limits_{n} x_{n\ 1} \quad 0$

2 $\lim\limits_{n} \left(\frac{\sin x_n}{x_n}\right)^{\frac{1}{x_n^2}}$ "1 "

$\because$

$$\lim_{t\ 0} \left(\frac{\sin t}{t}\right)^{\frac{1}{t^2}} \quad e^{\lim\limits_{t\ 0} \frac{1}{t^2} \ln \frac{\sin t}{t}}$$

$$e^{\lim\limits_{t\ 0} \frac{1}{2t} \frac{1}{\frac{\sin t}{t}} \frac{(t\cos t \quad \sin t)}{t^2}}$$

$$e^{\lim\limits_{t\ 0} \frac{t\cos t \quad \sin t}{2t^3}} \quad e^{\lim\limits_{t\ 0} \frac{t\ 1 \ \frac{t^2}{2} \ 0(t^2) \quad t \ \frac{t^3}{6} \ 0(t^3)}{2t^3}}$$

$$e^{\lim\limits_{t\ 0} \frac{\frac{1}{2}\ \frac{1}{6}\ t^3 \ 0(t^3)}{2t^3}} \quad e^{\frac{1}{6}}$$

92 $0 \quad a \quad b$ $b\sin b \quad 2\cos b \quad b \quad a\sin a \quad 2\cos a \quad \frac{1}{a}$

$f(x) \quad x\sin x \quad 2\cos x \quad x$

$0 \quad a \quad x$ $, f(x)$ 别

$f\ (x) \quad \sin x \quad x\cos x \quad 2\sin x$

$x\cos x \quad \sin x$

$f\ \ (x) \quad \cos x \quad x\sin x \quad \cos x \quad x\sin x \quad 0$

$f\ \ (x)$

$f\ (\ \ ) \quad \cos \quad 0$

$0 \quad a \quad x$ $f\ (x) \quad 0 \quad f(x)$ 别

$b \quad a \quad f(b) \quad f(a)$

93 L $\begin{matrix} x \quad t^2 \quad 1 \\ y \quad 4t \quad t^2 \end{matrix}$ $(t \quad 0)$

I L

II $(\ 1,0)$ L (x_0, y_0) 内

III L $x \quad x_0$ 单 x

I $\frac{dx}{dt} \quad 2t, \frac{dy}{dt} \quad 4 \quad 2t, \frac{dy}{dx} \quad \frac{4 \quad 2t}{2t} \quad \frac{2}{t} \quad 1$

$$\frac{d^2y}{dx^2} \quad \frac{d\,\frac{dy}{dx}}{dt} \quad \frac{1}{\frac{dx}{dt}} \quad \frac{2}{t^2} \quad \frac{1}{2t} \quad \frac{1}{t^3} \quad 0 \ \ (t \quad 0 \quad)$$

$L(\quad t \quad 0 \quad)$

II $y \quad 0 \quad \frac{2}{t} \quad 1 \ \ (x \quad 1)$ $x_0 \quad t_0^2 \quad 1 \quad y_0 \quad 4t_0 \quad t_0^2$

$$4t_0 \quad t_0^2 \quad \frac{2}{t_0} \quad 1 \ \ (t_0^2 \quad 2), 4t_0^2 \quad t_0^3 \quad (2 \quad t_0)(t_0^2 \quad 2)$$

$$t_0^2 \quad t_0 \quad 2 \quad 0, (t_0 \quad 1)(t_0 \quad 2) \quad 0 \ \because t_0 \quad 0 \quad t_0 \quad 1$$

$2 \quad 3$ $y \quad x \quad 1$

III L $x \quad g(y)$

$$S \int_0^3 g(y) \quad (y \quad 1) \quad dy$$

$t^2 \quad 4t \quad y \quad 0$ 内t $2 \ \sqrt{4 \quad y}$ $x \quad 2 \ \sqrt{4 \quad y}^{\,2} \quad 1$

$2 \quad 3$ L $y \quad 3 \quad x \quad 2$ $x \quad 2 \ \sqrt{4 \quad y}^{\,2} \quad 1 \quad g(y)$

$$S \int_0^3 9 \quad y \quad 4\sqrt{4 \quad y} \quad (y \quad 1) \ dy$$

$$\int_0^3 (10 \quad 2y)dy \quad 4\int_0^3 \sqrt{4 \quad y}dy$$

$$(10y \quad y^2)\Big|_0^3 \quad 4\int_0^3 \sqrt{4 \quad y}d(4 \quad y) \quad 21 \quad 4 \quad \frac{2}{3} \quad (4 \quad y)^{\frac{3}{2}}\Big|_0^3$$

$$21 \quad \frac{8}{3} \quad \frac{64}{3} \quad 3 \quad \frac{2}{3}$$

94 $x \quad 0$ $\sqrt{x}$

(A) $1 \quad e^{\sqrt{x}}$. (B) $\ln(1 \quad \sqrt{x})$. (C) $\sqrt{1 \quad \sqrt{x}} \quad 1$. (D) $1 \quad \cos\sqrt{x}$.

(B).

务 内

.

$$x \quad 0 \qquad 1 \quad e^{\sqrt{x}} \qquad (e^{\sqrt{x}} \quad 1) \sim \quad \sqrt{x} \qquad \ln(1 \quad \sqrt{x}) \sim \sqrt{x}$$

$$\sqrt{1 \quad \sqrt{x}} \quad 1 \sim \frac{1}{2}\sqrt{x} \qquad 1 \quad \cos\sqrt{x} \sim \frac{1}{2}(\sqrt{x})^2 \quad \frac{1}{2}x.$$ (B).

95 $f(x)$ x=0 合

(A) $\lim_{x \quad 0}\frac{f(x)}{x}$ $f(0)=0$. (B) $\lim_{x \quad 0}\frac{f(x) \quad f(\quad x)}{x}$ $f(0)=0$.

(C) $\lim_{x \quad 0}\frac{f(x)}{x}$ $f\ (0)$. (D) $\lim_{x \quad 0}\frac{f(x) \quad f(\quad x)}{x}$ $f\ (0)$

(D).

(A),(B) 0 0 内 $f(0)=0$.

$$\lim_{x \quad 0}\frac{f(x)}{x} \qquad f(0) \quad 0, f\ (0) \quad \lim_{x \quad 0}\frac{f(x) \quad f(0)}{x \quad 0} \quad \lim_{x \quad 0}\frac{f(x)}{x} \quad 0$$ (C) (D).

$f(x) \quad |x|$ x=0

$$\lim_{x \quad 0}\frac{f(x) \quad f(\quad x)}{x} = \lim_{x \quad 0}\frac{|x| \quad |\quad x|}{x} \quad 0$$ $f(x) \quad |x|$ x=0 .

96 $y \quad \frac{1}{x} \quad \ln(1 \quad e^x)$

(A) 0. (B) 1. (C) 2. (D) 3.

(D).

内

$$\lim_{x \quad 0}[\frac{1}{x} \quad \ln(1 \quad e^x)] \qquad x \quad 0$$

$$\lim_{x}[\frac{1}{x} \quad \ln(1 \quad e^x)] \quad 0$$ y=0

$$\lim_{x}\frac{y}{x} \quad \lim_{x}[\frac{1}{x^2} \quad \frac{\ln(1 \quad e^x)}{x}] \quad \lim_{x}\frac{\ln(1 \quad e^x)}{x} = \lim_{x}\frac{e^x}{1 \quad e^x} \quad 1$$

$$\lim_{x}[y \quad x] \quad \lim_{x}[\frac{1}{x} \quad \ln(1 \quad e^x) \quad x] = \lim_{x}[\ln(1 \quad e^x) \quad x]$$

$$= \lim_{x}[\ln e^x(1 \quad e^{\ x}) \quad x] \quad \lim_{x}\ln(1 \quad e^{\ x}) \quad 0$$

$y = x$. (D).

97 $\lim_{x}\frac{x^3 \quad x^2 \quad 1}{2^x \quad x^3}(\sin x \quad \cos x) =$______________ .

0.

$$\lim_{x}\frac{x^3 \quad x^2 \quad 1}{2^x \quad x^3} \quad 0$$ sinx+cosx

$$\lim_{x} \frac{x^3 \quad x^2 \quad 1}{2^x \quad x^3}(\sin x \quad \cos x) = \mathbf{0}.$$

98 $y \quad \frac{1}{2x \quad 3}$, $y^{(n)}(0) =$____________ .

$\frac{1}{3}(\quad 1)^n n!(\frac{2}{3})^n.$

$y \quad (2x \quad 3)^{1}$, $y \quad 1 \; 2(2x \quad 3)^2$ y, $1 \; (\quad 2) \; 2 \; (2x \quad 3)^3$ $(2$

$$y^{(n)} \quad (\quad 1)^n n! \, 2^n (2x \quad 3)^n$$

$$y^{(n)}(0) = \frac{1}{3}(\quad 1)^n n!(\frac{2}{3})^n.$$

99 $y = y(x)$ $y \ln y \quad x \quad y \quad 0$, $y = y(x)$ $(1, 1)$.

.

1 $y \ln y \quad x \quad y \quad 0$ x

$$y \ln y \quad 2y \quad 1 \quad 0$$

$$y \quad \frac{1}{\ln y \quad 2}$$

x $$y \quad \frac{\frac{1}{y} \quad y}{(\ln y \quad 2)^2} \quad \frac{1}{y(\ln y \quad 2)^3}.$$

$x=1$, $y=1$ $y \quad \frac{1}{8}$

y $x=1$, $y \quad \frac{1}{8}$, $x=1$ y <0, $y = y(x)$ (1, 1) .

2 $y \ln y \quad x \quad y \quad 0$ x

$$y \ln y \quad 2y \quad 1 \quad 0$$

x $$y \ln y \quad y \quad \frac{1}{y} y \quad 2y \quad 0$$

$x=1$, $y=1$ $y \quad \frac{1}{2}$, $y \quad \frac{1}{8}$

y $x=1$, $y \quad \frac{1}{8}$, $x=1$ y <0, $y = y(x)$ (1, 1) .

3 x y , $y \ln y \quad x \quad y \quad 0$ y

$$x \quad \ln y \quad y \frac{1}{y} \quad 1 \quad \ln y$$

y x $\frac{1}{y}$

x=1, y =1 x 1. x y=1 , x 1 y=1
x >0, $x = x(y)$ (1, 1) , $y = y(x)$ (1, 1) .

100 $f(x)$, $g(x)$ $[a, b]$ (a, b) $f(a)=g(a)$, $f(b)=g(b)$,

(a,b) f ( ) g ( ).

$F(x)$ $f(x)$ $g(x)$ 务

F ( ) 0, $F(x)$ $F(x)$ (

) $F(a)=F(b)=0$, c (a,b) $F(c)$ 0 $[a,c],[c,b]$

$F(x)$

$F(x)$ $f(x)$ $g(x)$ $F(a)=F(b)=0$. $f(x)$, $g(x)$ (a, b) ,

x_1 x_2, x_1, x_2 (a,b)

$f(x_1)$ M $\max_{[a,b]} f(x), g(x_2)$ M $\max_{[a,b]} g(x)$

x_1 x_2 c x_1, $F(c)$ 0.

x_1 x_2 $F(x_1)$ $f(x_1)$ $g(x_1)$ 0, $F(x_2)$ $f(x_2)$ $g(x_2)$ 0

c $[x_1, x_2]$ (a,b) $F(c)$ 0.

$[a,c],[c,b]$ $_1$ (a,c), $_2$ (c,b)

F ($_1$) F ($_2$) 0.

$F(x)$ [$_1$, $_2$] ($_1$, $_2$) (a,b)

F ( ) 0 f ( ) g (