

## 习题

$$23.(2).(-2x+2)e^{-x^2+2x-1}$$

$$(4).\frac{6x^2+\cos x}{2x^3+\sin x}$$

$$(6).-\frac{1}{\sqrt{2x(1-x)}(x+1)}$$

$$(8).\frac{1-\sqrt{1-x^2}}{x^2\sqrt{1-x^2}}$$

$$(10).\frac{-\sin 2x}{|\cos x|(1+\sin x^2)^{\frac{3}{2}}}$$

$$(12).(\sin x)^{\cos 3x}(-\sin 3x \ln \sin x + \frac{\cos 3x}{\tan x})$$

$$(14).\frac{2x \cos x^2+1}{1+\sin x^2+1^2}$$

$$(16).\arcsin(\ln x) + \frac{1}{\sqrt{1-(\ln x)^2}}$$

$$(20).2(x+1)7^{x^2+2x} \ln 7$$

$$(23).a^{a^x+x} - (\ln a)^2 + a^{x^a+1} \ln ax^{a-1} + a^a x^{a^a-1}$$

$$(24).e^x x > 0; -e^{-x} x < 0$$

$$24.(1).\frac{f(x)f'(x)+g(x)g'(x)}{\sqrt{f^2(x)+g^2(x)}}$$

$$(2).f'(e^x)e^{x+g(x)} + e^{g(x)}g'(x)f(e^x)$$

$$(3).xe^{f(-x)}\left(\frac{e^{f(-x)}}{x} - f'(-x)e^{f(-x)} \ln x\right)$$

$$(4).\begin{cases} -1 & -\infty < x < 1 \\ 2x-3 & 1 \leq x \leq 2 \\ 1 & 2 < x < +\infty \end{cases}$$

$$25.(4).\frac{dy}{dx} = -\frac{y+e^x}{x+e^{-y}}$$

$$(5).\frac{dy}{dx} = \frac{\cos y - \cos(x+y)}{\cos(x+y) + x \sin y}$$

$$26.(1).y = -\frac{1}{2}x + \frac{3}{2}$$

$$27(2).\frac{2}{e^t}$$

$$(3).-4 \sin t$$

$$30.(x+5)^2 + (y+10)^2 = 225$$

$$32.(1).-4e^x \cos x$$

$$(2).2^{50}e^{2x}(x^3 + 75x^2 + \frac{3675}{2}x + 14700)$$

$$(3) f(x) = \frac{1}{3}\left(\frac{1}{x-1} - \frac{1}{x+2}\right), f^{(n)}(x) = \frac{(-1)^n n!}{3}\left(\frac{1}{(x-1)^{n+1}} - \frac{1}{(x+2)^{n+1}}\right)$$

$$(4) \; f(x)=2^{1/3}(x-\tfrac{1}{2})^{1/3}, \; f^{(n)}(x)=2^{1/3}(\tfrac{1}{3}-1)(\tfrac{1}{3}-2)\cdots(\tfrac{1}{3}-n)(x-\tfrac{1}{2})^{\frac{1}{3}-n}$$

$$(5). \begin{cases} \ln x + 1 + \frac{1}{x} & n = 1 \\ \frac{(-1)^n (n-2)!(x-n+1)}{x^n} & n \leq 2 \end{cases}$$

$$(6).-2^{n-1}\cos(2x+\frac{n\pi}{2})$$

$$33.-\frac{f''(x)}{(f'(x))^3}$$

$$34.n!\varphi(a)$$

$$37.(1)^{\frac{1-3t^2}{-2t}}$$

$$(2)^{\frac{3t^2+1}{-4t^3}}$$

$$(3)-\frac{3}{8}(\frac{1}{t^2}+\frac{1}{t^5})$$

$$39.y''=-\frac{\sin(x+y)}{(1-\cos(x+y))^3}$$