3.(2) 解. 计算可得

$$\mathrm{d}y = \big(x\sin 2x\big)'\,\mathrm{d}x = \big(\sin 2x + x\cos 2x\cdot(2x)\big)\,\mathrm{d}x = \big(\sin 2x + 2x\cos 2x\big)\,\mathrm{d}x. \qquad \blacksquare$$

3.(7) 解. 计算可得

$$\begin{aligned}\mathrm{d}y &= \mathrm{d}\arcsin\sqrt{1-x^2}\\ &= \frac{1}{\sqrt{1-\left(\sqrt{1-x^2}\right)^2}}\,\mathrm{d}\sqrt{1-x^2} = \frac{1}{\sqrt{x^2}}\cdot\frac{1}{2\sqrt{1-x^2}}\cdot\mathrm{d}(1-x^2)\\ &= \frac{1}{|x|}\cdot\frac{1}{2\sqrt{1-x^2}}\cdot(-2x\,\mathrm{d}x) = -\frac{x}{|x|}\cdot\frac{\mathrm{d}x}{\sqrt{1-x^2}}.\end{aligned}$$

所以

$$\mathrm{d}y = \begin{cases}\dfrac{\mathrm{d}x}{\sqrt{1-x^2}} & x\in(-1,0),\\[2ex] \dfrac{-\mathrm{d}x}{\sqrt{1-x^2}} & x\in(0,1).\end{cases} \qquad \blacksquare$$

4.(2) 解. 由常用微分公式及其运算法则可知

$$\mathrm{d}\Big(\frac{3}{2}x^2 + C\Big) = 3x\,\mathrm{d}x. \qquad \blacksquare$$

4.(5) 解. 由常用微分公式及其运算法则可知

$$\mathrm{d}\big(\ln|1+x| + C\big) = \frac{1}{1+x}\,\mathrm{d}x. \qquad \blacksquare$$

4.(7) 解. 由常用微分公式及其运算法则可知

$$\mathrm{d}\Big(2\sqrt{x} + C\Big) = \frac{1}{\sqrt{x}}\,\mathrm{d}x. \qquad \blacksquare$$