

$$\begin{aligned}
 (3) \int \frac{\sqrt{1+2\arctan x}}{1+x^2} dx &= \int \sqrt{1+2\arctan x} d(\arctan x) \\
 &= \int \sqrt{1+2u} du (u = \arctan x) \\
 &= \frac{1}{2} \int \sqrt{1+2u} d(1+2u) = \frac{1}{3} (1+2u)^{\frac{3}{2}} + C \\
 &= \frac{1}{3} (1+2\arctan x)^{\frac{3}{2}} + C.
 \end{aligned}$$

$$\begin{aligned}
 (4) \quad &\text{令 } x = a \sin t \left(-\frac{\pi}{2} \leq t \leq \frac{\pi}{2} \right), dx = a \cos t dt \\
 \int \sqrt{a^2 - x^2} dx &= \int \sqrt{a^2(1 - \sin^2 t)} \cdot a \cos t dt = a^2 \int \cos^2 t dt \\
 &= a^2 \int \frac{1 + \cos 2t}{2} dt = \frac{a^2}{2} \left(t + \frac{\sin 2t}{2} \right) + C \\
 &= \frac{a^2}{2} \arcsin \frac{x}{a} + \frac{x}{2} \sqrt{a^2 - x^2} + C.
 \end{aligned}$$

$$\arcsin[\sin x]$$

$$= \arcsin[-\sin(x-\pi)]$$

$$= -(x-\pi)$$

$$X = \frac{-b_4^{23} + \sqrt{b + \sqrt[n]{34^2}}}{\frac{2a^3}{3} + (12)}$$

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$$\begin{aligned}a^3 + b^3 &= a^3 + a^2 \times b + b^3 - a^2 \times b \\&= a^2(a + b) - b(a^2 - b^2) \\&= a^2(a + b) - b(a + b)(a - b) \\&= (a + b)[a^2 - b(a - b)] \\&= (a + b)(a^2 - ab + b^2)\end{aligned}$$

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