

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

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

$$\begin{aligned} & \arcsin[\sin x] \\ &= \arcsin[-\sin(x-\pi)] \\ &= -(x-\pi) \end{aligned}$$

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

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