

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

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

The terrible earthquake and the following tsunami have caused so many people's injuries and deaths. Besides, many citizens become homeless. We Chinese feel greatly sorry for the pains you are suffering. And I do hope you can overcome those great difficulties.

Please remember Japan isn't alone. People all over the world are lending hands to the areas struck by tsunami and earthquake. Now that the disaster has happened. we should face it bravely and rebuild the homes. thus creating a stronger country. Tomorrow is another day. All the things will be better.

$$\arcsin[\sin x]$$

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

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