$\sqrt{a^2-x^2}$ in integrandum.

$u=\sqrt{a^2-x^2} \Rightarrow u^2=a^2-x^2$

$\Rightarrow x=\sqrt{a^2-u^2}$

$x = a\sin t$

$a^2-x^2 = a^2-a^2\sin^2 t = a^2(1-\sin^2 t)$

$= a^2\cos^2 t$

$\sqrt{a^2-x^2} = a\cos t$

Oef 1 (3)

$\int \sqrt{a^2-x^2}\,dx = \int a\cos t\, a\cos t\,dt$

$x = a\sin t \Rightarrow dx = a\cos t\,dt$

$\sqrt{a^2-x^2} = a\cos t$ $\quad \sin t = \frac{x}{a} \Rightarrow t = \text{bgsin}\left(\frac{x}{a}\right)$

$= a^2 \int \cos^2 t\,dt$

$= a^2 \int \frac{\cos(2t)+1}{2}\,dt$

$= \frac{a^2}{2}\cdot\frac{1}{2}\int \cos 2t\,d(2t) + \frac{a^2}{2}t$

$= \frac{a^2}{4}\sin 2t + \frac{a^2}{2}t + C$

$= \frac{a^2}{2}\sin t\cos t + \frac{a^2}{2}t + C$

$= \frac{1}{2}x\sqrt{a^2-x^2} + \frac{a^2}{2}\,\text{bgsin}\left(\frac{x}{a}\right) + C$