Let $x = 2\sin\theta \Longrightarrow dx = 2\cos\theta\, d\theta$

$\therefore \int \frac{dx}{\sqrt{4-x^2}} = \int \frac{2\cos\theta\, d\theta}{\sqrt{4-4\sin^2\theta}} = \int \frac{2\cos\theta\, d\theta}{\sqrt{4(1-\sin^2\theta)}} = \int \frac{2\cos\theta\, d\theta}{\sqrt{4\cos^2\theta}}$

$= \int \frac{2\cos\theta}{2\cos\theta}\, d\theta = \int d\theta = \theta + c$

$\therefore x = 2\sin\theta \longrightarrow \sin\theta = \frac{x}{2} \longrightarrow \theta = \sin^{-1}\left(\frac{x}{2}\right)$

$\therefore \int \frac{dx}{\sqrt{4-x^2}} = \theta + c = \sin^{-1}\left(\frac{x}{2}\right) + c$

② $\int \frac{x^2\, dx}{\sqrt{9-x^2}} \Longrightarrow$ Let $x = 3\sin\theta \longrightarrow dx = 3\cos\theta\, d\theta$ & $\theta = \sin^{-1}\left(\frac{x}{3}\right)$

$\therefore \int \frac{x^2\, dx}{\sqrt{9-x^2}} = \int \frac{(3\sin\theta)^2}{\sqrt{9-9\sin^2\theta}} \cdot 3\cos\theta\, d\theta = \int \frac{9\sin^2\theta}{\sqrt{9(1-\sin^2\theta)}} \cdot 3\cos\theta\, d\theta$

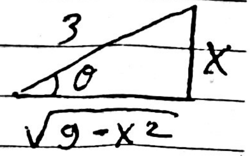
$= \int \frac{9\sin^2\theta}{\sqrt{9\cos^2\theta}} \cdot 3\cos\theta\, d\theta = \int \frac{9\sin^2\theta}{\cancel{3\cos\theta}} \cdot \cancel{3\cos\theta}\, d\theta$

$= 9\int \sin^2\theta\, d\theta = 9\int \left(\frac{1}{2} - \frac{1}{2}\cos 2\theta\right) d\theta$

$= \frac{9}{2}\int d\theta - \frac{9}{2}\int \cos 2\theta\, d\theta = \frac{9}{2}\theta - \frac{9}{4}\sin 2\theta + c$

$= \frac{9}{2}\theta - \frac{9}{4} \cdot 2\sin\theta\cos\theta + c = \frac{9}{2}\theta - \frac{9}{2}\sin\theta\cos\theta + c$

$\therefore \int \frac{x^2\, dx}{\sqrt{9-x^2}} = \frac{9}{2}\sin^{-1}\left(\frac{x}{3}\right) - \frac{9}{2} \cdot \frac{x}{\cancel{3}} \cdot \frac{\sqrt{9-x^2}}{\cancel{3}} + c$



$\therefore \int \frac{x^2\, dx}{\sqrt{9-x^2}} = \frac{9}{2}\sin^{-1}\left(\frac{x}{3}\right) - \frac{x}{2} \cdot \sqrt{9-x^2} + c$