5. $\int (5 \arcsin x)\, dx$

$= 5 \int \underbrace{\arcsin x}_{u} \underbrace{dx}_{dv}$

$uv - \int v\, du$

$u = \arcsin x \qquad dv = dx$

$du = \frac{1}{\sqrt{1-x^2}}\, dx \qquad v = \int dx$

$v = \int 1\, dx$

$v = x$

$= 5\left[\arcsin x\,(x) - \int x\left(\frac{1}{\sqrt{1-x^2}}\right) dx\right]$

$= 5\left[x \arcsin x - \int \frac{x}{\sqrt{1-x^2}}\, dx\right]$

$u = 1 - x^2 \quad du = -2x\, dx$

$= 5\left[x \arcsin x - \left(-\frac{1}{2}\right) \int \frac{-2x}{\sqrt{1-x^2}}\, dx\right]$

$= 5\left[x \arcsin x + \frac{1}{2} \int \frac{1}{\sqrt{u}}\, du\right]$

$= 5\left[x \arcsin x + \frac{1}{2} \int \frac{1}{u^{1/2}}\, du\right]$

$= 5\left[x \arcsin x + \frac{1}{2} \int u^{-\frac{1}{2}}\, du\right]$

$= 5\left[x \arcsin x + \frac{1}{2} \cdot \frac{u^{-\frac{1}{2}+1}}{-\frac{1}{2}+1}\right] + C$

$= 5\left[x \arcsin x + \frac{1}{2} \cdot \frac{u^{1/2}}{\frac{1}{2}}\right] + C$

$= 5\left[x \arcsin x + \sqrt{u}\right] + C$

$= \boxed{5x \arcsin x + 5\sqrt{1-x^2} + C}$