$$\int x^2\sqrt{1-x^2}\,dx$$

$(a)^2 - (x)^2$

$(1)^2 - (x)^2$

$x = a\,\text{SEN}(\alpha)$ $\qquad$ $x = \text{SEN}(\alpha)$

$dx = a\cos(\alpha)\,d\alpha$ $\qquad$ $dx = \cos(\alpha)\,d\alpha$

$$\int (\text{SEN}(\alpha))^2 \cdot \sqrt{1-(\text{SEN}(\alpha))^2} \cdot \cos(\alpha)\,d\alpha$$

$$\int \text{SEN}^2(\alpha)\cdot\underbrace{\sqrt{1-\text{SEN}^2(\alpha)}}_{\cos^2\alpha = 1-\text{SEN}^2(\alpha)}\cdot\cos(\alpha)\,d\alpha$$

$$\int \text{SEN}^2(\alpha)\cdot\sqrt{\cos^2(\alpha)}\cdot\cos(\alpha)\,d\alpha$$

6α

4α

$$\int \text{SEN}^2(\alpha)\cdot\cos^2(\alpha)\,d\alpha$$

$\text{SEN}^2(2\alpha) = \dfrac{1-\cos(2\alpha)}{2}$

2α

$\cos^2(\alpha) = \dfrac{1+\cos(2\alpha)}{2}$

$$\int \left(\frac{1-\cos(2\alpha)}{2}\right)\cdot\left(\frac{1+\cos(2\alpha)}{2}\right)d\alpha$$

$\dfrac{A}{B}\cdot\dfrac{C}{D} = \dfrac{A\cdot C}{B\cdot D}$

$(a+b)(a-b) = a^2-b^2$

1

$$\int \frac{1-\cos^2(2\alpha)}{4}\,d\alpha = \frac{1}{4}\cdot\int 1-\cos^2(2\alpha)\,d\alpha$$

$\text{SEN}^2(\alpha)$

$$\frac{1}{4}\cdot\int \cancel{1}-(\cancel{1}-\text{SEN}^2(2\alpha))\,d\alpha = \frac{1}{4}\cdot\int \text{SEN}^2(2\alpha)\,d\alpha$$

$$= \frac{1}{4}\cdot\int\frac{1-\cos(4\alpha)}{2}\,d\alpha = \frac{1}{8}\cdot\int 1-\cos(4\alpha)\,d\alpha$$

$\int \cos(ax) = \frac{1}{a}\cdot\text{SEN}(ax)$

$$\frac{1}{8}\left[\int 1\,d\alpha - \int\cos(4\alpha)\,d\alpha\right] = \frac{1}{8}\left[\alpha - \frac{1}{4}\,\text{SEN}(4\alpha)\right]+C$$

$$\boxed{\frac{\alpha}{8} - \frac{\text{SEN}(4\alpha)}{32} + C}$$

$x = \text{SEN}(\alpha) /$ ARCSEN

$\alpha = \text{ARCSEN}(x)$

$$\boxed{\frac{\text{ARCSEN}(x)}{8} - \frac{\text{SEN}(4\,\text{ARCSEN}(x))}{32} + C}$$

$$\int \frac{8}{x^2\sqrt{4-x^2}}\,dx = 8\int\frac{dx}{x^2\sqrt{4-x^2}}$$

$(2)^2 - (x)^2$

$x = 2\,\text{SEN}(\alpha)$

$dx = 2\cos(\alpha)\,d\alpha$

$$= 8\cdot\int\frac{2\cos(\alpha)}{[2\,\text{SEN}(\alpha)]^2\cdot\sqrt{4-(2\,\text{SEN}(\alpha))^2}}\,d\alpha$$

$$= 8\cdot\int\frac{2\cos(\alpha)}{4\,\text{SEN}^2(\alpha)\cdot\sqrt{\underbrace{4-4\,\text{SEN}^2(\alpha)}_{4(1-\text{SEN}^2(\alpha))}}}\,d\alpha$$

$$= 8\cdot\int\frac{2\cos(\alpha)}{4\,\text{SEN}^2(\alpha)\cdot\sqrt{4\cos^2(\alpha)}}\,d\alpha$$

$(\text{SEN}(\alpha))^{-1} = \dfrac{1}{\text{SEN}(\alpha)}$

$\csc(\alpha)$

$(\text{SEN}(\alpha))^{-2} = \dfrac{1}{\text{SEN}^2(\alpha)}$

$= \csc^2(\alpha)$

$$= 8\cdot\int\frac{\cancel{2}\cancel{\cos(\alpha)}}{4\,\text{SEN}^2(\alpha)\cdot\cancel{2}\cancel{\cos(\alpha)}}\,d\alpha = \cancel{8}\cdot\frac{1}{\cancel{4}}\int\frac{1}{\text{SEN}^2(\alpha)}\,d\alpha$$

$$= 2\int\frac{1}{\text{SEN}^2(\alpha)}\,d\alpha = 2\cdot\int\csc^2(\alpha)\,d\alpha = 2\cdot -\text{CTg}(\alpha)+C$$

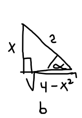
$$= -2\,\text{CTg}(\alpha)+C$$

$x = 2\,\text{SEN}(\alpha)$

CAT OP $\to$ $\dfrac{x}{2} = \text{SEN}(\alpha)$ $= \text{ARCSEN}\left(\dfrac{x}{2}\right)$

HIP $\to$

$$= \boxed{-2\,\text{CTg}\left(\text{ARCSEN}\left(\frac{x}{2}\right)\right)+C}$$



$x^2 + b^2 = 2^2$ $\qquad$ $\text{Tg}(\alpha) = \dfrac{\text{CAT OP}}{\text{CAT ADY}}$

$\text{CTg}(\alpha) = \dfrac{\text{CAT ADY}}{\text{CAT OP}}$

$$\boxed{= -\frac{2\sqrt{4-x^2}}{x} + C}$$