$$\int \frac{x^2}{x^4+2x^2+1}\,dx$$

$$= \int \frac{x^2}{(x^2+1)^2}\,dx = \int \frac{x^2+1-1}{(x^2+1)^2}\,dx$$

$$\int \frac{dx}{x^2+1} = \tan^{-1}(x)$$

$$= \int \frac{\cancel{x^2+1}}{(x^2+1)^{\cancel{2}}}\,dx - \int \frac{dx}{(x^2+1)^2}$$

$x = \tan\theta$

$dx = \sec^2\theta\, d\theta$

$$= \tan^{-1}(x) - \int \frac{\sec^2\theta\, d\theta}{\sec^4\theta} = \tan^{-1}(x) - \int \cos^2\theta\, d\theta$$

$$\int \cos^2\theta\, d\theta$$

$$= \int \left(\frac{1+\cos 2\theta}{2}\right) d\theta$$

$$= \frac{\theta}{2} + \frac{\operatorname{sen} 2\theta}{4} + C$$

$\operatorname{sen} 2\theta = 2\cos\theta \operatorname{sen}\theta$

$$= \tan^{-1}(x) - \frac{\theta}{2} - \frac{2\cos\theta \operatorname{sen}\theta}{4} + C = \tan^{-1}(x) - \frac{\tan^{-1}(x)}{2} - \frac{x}{2(x^2+1)} + C$$

$\int u\,dv = uv - \int v\,du$

$$\int (x^2+5x+6)\cos(2x)\,dx$$

$$= \int x^2\cos(2x)\,dx + \int 5x\cos(2x)\,dx + \int 6\cos(2x)\,dx$$

$$6\,\frac{\operatorname{sen}(2x)}{2}$$

$u = x^2$, $v = \frac{\operatorname{sen}(2x)}{2}$

$du = 2x\,dx$, $dv = \cos(2x)\,dx$

$$\int x^2\cos(2x)\,dx = \frac{x^2\operatorname{sen}(2x)}{2} - \int \frac{\operatorname{sen}(2x)}{\cancel{2}}\cancel{2}x\,dx$$

$u = x$, $du = dx$, $v = \frac{-\cos(2x)}{2}$, $dv = \operatorname{sen}(2x)\,dx$

$$= \frac{x^2\operatorname{sen}(2x)}{2} - \left[\frac{-x\cos(2x)}{2} + \int\frac{\cos(2x)}{2}\,dx\right]$$

$$= \frac{x^2\operatorname{sen}(2x)}{2} + \frac{x\cos(2x)}{2} - \frac{1}{4}\operatorname{sen}(2x) + C$$

$$5\left(\frac{x\operatorname{sen}2x}{2} + \frac{\operatorname{sen}^2 x}{2}\right)$$

$$= \frac{x^2\operatorname{sen}(2x)}{2} + \frac{x\cos(2x)}{2} - \frac{1}{4}\operatorname{sen}(2x)$$

$$+ 5\left(\frac{x\operatorname{sen}(2x)}{2} + \frac{\operatorname{sen}^2 x}{2}\right) + 3\operatorname{sen}(2x) + C$$

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$$\int \frac{x e^{\arcsin(x)}}{\sqrt{1-x^2}}\,dx \qquad x = \operatorname{sen}\theta \qquad dx = \cos\theta\, d\theta$$

$$= \int \frac{\operatorname{sen}\theta\, e^{\arcsin(\operatorname{sen}\theta)}}{\sqrt{1-\operatorname{sen}^2\theta}}$$

$$= \int \frac{\operatorname{sen}\theta}{\cancel{\cos\theta}}\,\cancel{\cos\theta}\, e^{\theta}\, d\theta \quad , \quad u = \operatorname{sen}\theta,\ du = \cos\theta\, d\theta \quad , \quad v = e^{\theta},\ dv = e^{\theta} d\theta$$

$$= \int \operatorname{sen}\theta\, e^{\theta}\, d\theta = e^{\theta}\operatorname{sen}\theta - \int e^{\theta}\cos\theta\, d\theta \quad , \quad u = \cos\theta,\ du = -\operatorname{sen}\theta\, d\theta \quad , \quad v = e^{\theta},\ dv = e^{\theta} d\theta$$

$$= e^{\theta}\operatorname{sen}\theta - \left[e^{\theta}\cos\theta + \int e^{\theta}\operatorname{sen}\theta\, d\theta \right]$$

$$\int e^{\theta}\operatorname{sen}\theta\, d\theta = \frac{e^{\theta}(\operatorname{sen}\theta - \cos\theta)}{2} + C$$

$$\int \cos^2\theta\, d\theta$$

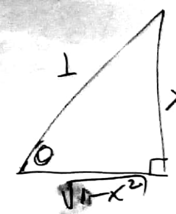
$$= \int \left(\frac{1+\cos 2\theta}{2}\right) d\theta$$

$$\frac{\theta}{2} + \frac{\operatorname{sen}2\theta}{4} + C$$

$\operatorname{sen}2\theta = 2\cos\theta\operatorname{sen}\theta$

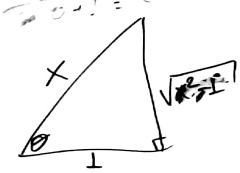
$\sin^2\theta + \cos^2\theta = 1$

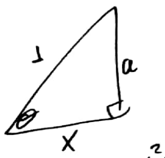
$\tan^2\theta + 1 = \sec^2\theta$



$x = \sec\theta$

$dx = \sec\theta\tan\theta\, d\theta$





$\frac{x}{1} = \cos\theta$

$e^{\arcsin(x)}\frac{\left(x-\sqrt{1-x^2}\right)}{2} + C$

$(\sqrt{x})^2$

$y = \sin x + 5$

$y' = \cos x$

$\int_a^b$

$x^2 + a^2 = 1$

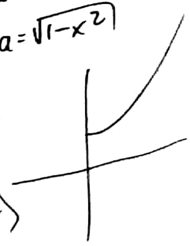
$a^2 = 1 - x^2$

$a = \sqrt{1-x^2}$

cos

[0,2]

[0,2]



$\frac{1}{x} + C$