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Nombre del tema: problemario

Parcial: III

Nombre de la Materia: Matematica aplicada

Nombre del profesor: VANIA NATALI SANTIZO MORALES

Nombre de la carrera: Enfermeria

Fecha de realización:

Nombre de la institución: UDS

plataforma.

> Problemario.

No Cuadrado.

$\int \frac{1}{x^2+4x+5}\,dx$ $\quad u=x+2 \quad x=u-2 \quad dx=du$

$x^2+4x+5=(x+5)(x-1)$

$\int \frac{1}{x^2+4x-5}\,dx = \int \frac{1}{(u-2)^2+4(u-2)-5}\,du$

$(u-2)^2=u^2-4u+4$

$4(u-2)=4u-8 \qquad u^2-4u+4+4u-8-5=u^2-9$

$\int \frac{1}{x^2+4x+5}\,dx = \int \frac{1}{u^2-a}\,du$

$\int \frac{1}{u^2-a^2}\,du = \frac{1}{2a\ln}\left[\frac{u-a}{u+c}\right]+C = \frac{1}{6}\ln\left[\frac{u-3}{u+3}\right]+C$

$\int \frac{1}{x^2+4x-5}\,dx = \frac{1}{6}\ln\left[\frac{x-1}{x+5}\right]+C$

Si Cuadrado.

$$\int \frac{1}{x^2-10x+30}$$

$x^2-10x+30-(x-5)^2+5 = x^2-10x+25+5$

$u = x-5$ $\quad dx = du$

$x = u+5$

$$\int \frac{1}{(x-5)^2+5}\,dx \qquad \int \frac{1}{u^2+5}\,du$$

$$\int \frac{1}{u^2+a^2}\,du = \frac{1}{a}$$

$\left(\frac{u}{a}\right)+C \qquad a^2=5 \quad a=\sqrt{5}$

$$\int \frac{1}{\sqrt{5}} \operatorname{arctan}\left(\frac{u}{\sqrt{5}}\right)+C$$

$v = x-5$

$$\int \frac{1}{x^2-10x+30}\,dx = \frac{1}{\sqrt{5}} \operatorname{arctan}\left(\frac{x-5}{\sqrt{5}}\right)+C$$

Un Cuadrado

Coadrado.

$$\int \frac{1}{x^2-8x+20}\,dx \qquad u=x-4 \quad du=dx$$

$$x^2-8x+20=(x-4)^2+4$$

$$(x-4)^2=x^2+8x+16 \quad (x-4)^2+4=x^2-8x+20.$$

$$\int \frac{1}{u^2+4}\,du \qquad \int \frac{1}{u^2+a^2}\,du=\frac{1}{a}\arctan\left(\frac{u}{a}\right)+c$$

$$a^2=4 \quad a=2$$

$$\int \frac{1}{u^2+4}\,du=\frac{1}{2}\arctan\left(\frac{u}{a}\right)+c$$

$$\frac{u}{2}=\frac{x-4}{2}$$

$$\int \frac{1}{x^2-8x+20}\,dx=\frac{1}{2}\arctan\left(\frac{x-4}{2}\right)+c$$

NO Cuadrado.

$$\int \frac{1}{x^2+12x+27}\,dx =$$

$$x^2+12x+27 = (x+6)^2+9$$
$$x^2+12x+27 = (x+6)^2-9$$

$$\int \frac{1}{(x+6)^2-3^2} \qquad u = x+6 \qquad du = dx$$

$$\int \frac{1}{u^2-9}\,du$$

$$\int \frac{1}{u^2-3^2}\,du = \frac{1}{2\cdot 3}\,\mathrm{Ln}\left[\frac{u-3}{u+3}\right]+C \quad \frac{1}{6}\,\mathrm{Ln}$$

$$\left[\frac{u-3}{u+3}\right]+C$$

$$\int \frac{1}{x^2+12x+27}\,dx = \frac{1}{6}\,\mathrm{Ln}\left[\frac{x+3}{x+9}\right]+C$$

Cuadrado

$\int \frac{1}{x^2+6x+10}\,dx$ $\quad u=x+3 \quad du=dx$

$x^2+6x+10=(x+3)^2+1$

$(x+3)^2=x^2+6x+9$

$x^2+6x+10=(x+3)^2+1$

$\int \frac{1}{u^2+1}\,du$

$\int \frac{1}{u^2+c}\,du=\arctan(u)+C$

$\int \frac{1}{x^2+6x+10}\,dx=\arctan(x+3)+c.$

No Cuadrado.

~~$\int \frac{1}{x^2+8x+21}\,dx$~~

$\int (x^2+8x+21)\,dx$

$\int (x^2+8x+21)\,dx=\int x^2\,dx+\int 8x\,dx+\int 21\,dx$

$\frac{x^3}{3}+\frac{x}{8.2}+21x+C=$

$\frac{x^3}{3}+4x^2+21x+C$

No Cuadrado.

$\int \frac{1}{x^2+2x-8}\,dx$

$x^2+2x-8=(x+1)^2-9$

$(x+1)^2=x^2+2x+1 \quad (x+1)^2-9=x^2+2x-8$

$\int \frac{1}{(x+1)^2-3^2}\,dx$

$\int \frac{1}{u^2-a}\,du \quad \int \frac{1}{a^2-a^2}\,du=\frac{1}{2a}\ln\left[\frac{u-a}{u+a}\right]+c$

$\int \frac{1}{u^2-a}\,du=\frac{1}{6}\ln\left[\frac{u-3}{u+3}\right]+c$

$u-3=x+1-3=x-2$

$u+3=x+1+3=x+4$

Cuadrado.

$$\int \frac{1}{x^2-10x+16}$$

$$x^2-10+25-9=(x-5)^2-9$$

$$x^2-10x+16=(x-5)^2-9$$

$$\int \frac{1}{(x-5)^2-3^x}\,dx \qquad u=x-5 \quad du=dx$$

$$\int \frac{1}{u^2-9}\,du$$

$$\int \frac{1}{u^2-a^2}\,du=\frac{1}{2a}\ln\left[\frac{u-a}{u+a}\right]+c$$

$$\frac{1}{2\cdot 3}\ln\left[\frac{u-3}{u+3}\right]+c \quad \frac{1}{6}\ln\left[\frac{x-3}{x-2}\right]+c$$

$$\int \frac{1}{x^2-10x+16}\,dx=\frac{1}{6}\ln\left[\frac{x-8}{x-2}\right]+d$$