Practica

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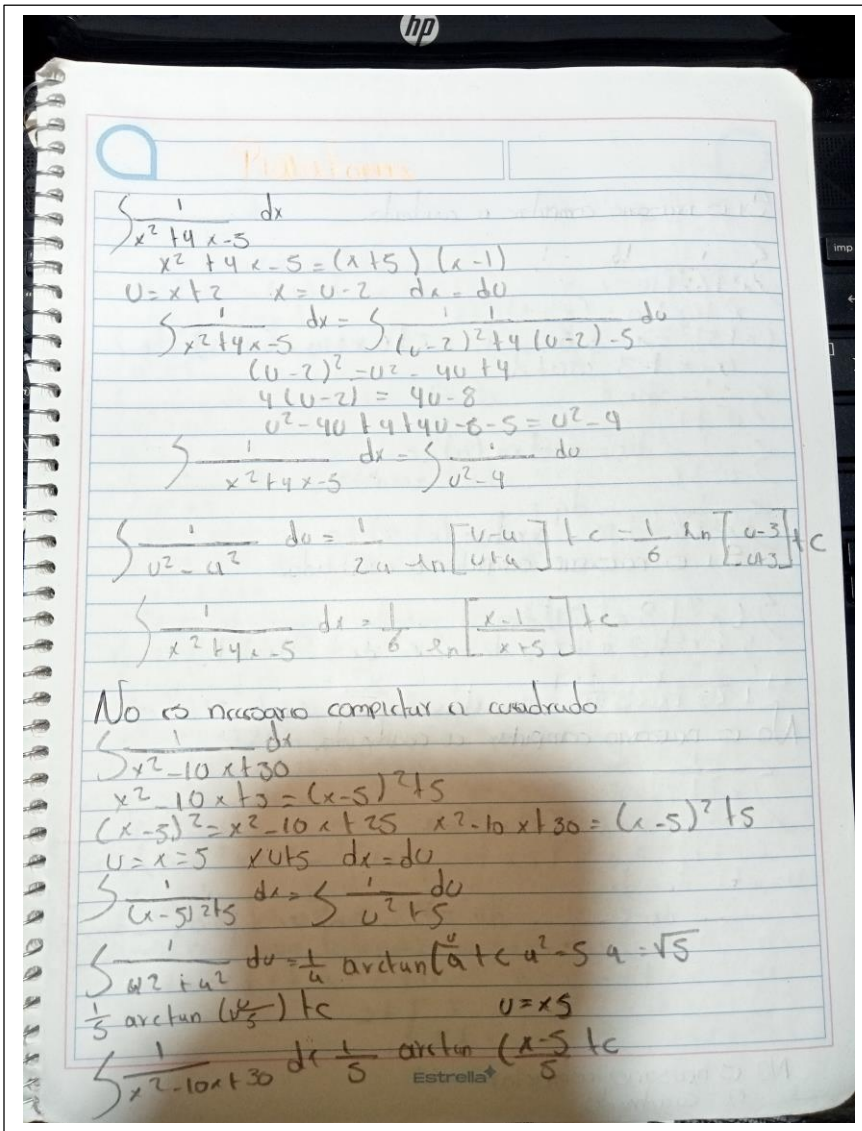
Nombre del tema: Problema rio

Nombre de la Materia: matemáticas

Nombre del profesor: Venia Natali zantizo

Cuatrimestre: 6°



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

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

$u=x+2 \quad x=u-2 \quad dx=du$

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

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

$4(u-2)=4u-8$

$u^2-4u+4+4u-8-5=u^2-9$

$$\int \frac{1}{x^2+4x-5}\,dx=\int \frac{1}{u^2-9}\,du$$

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

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

No es necesario completar el cuadrado

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

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

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

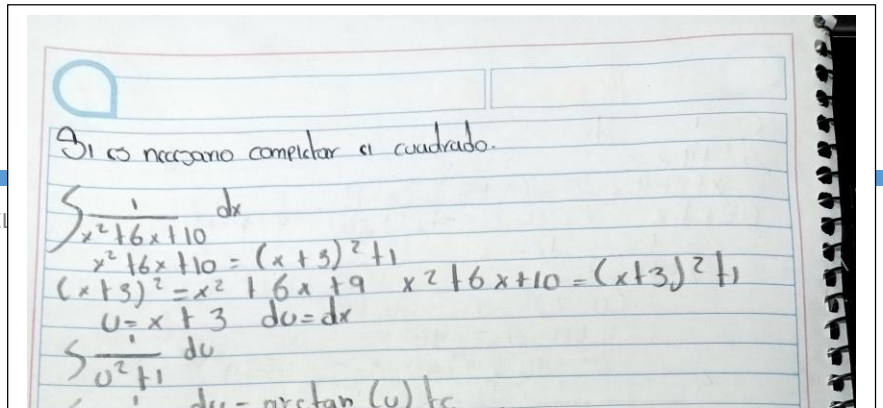
$u=x-5 \quad x=u+5 \quad dx=du$

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

$$\int \frac{1}{u^2+a^2}\,du=\frac{1}{a}\arctan\left(\frac{u}{a}\right)+c \quad a^2=5 \quad a=\sqrt{5}$$

$\frac{1}{5}\arctan\left(\frac{u}{5}\right)+c \qquad u=x-5$

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



Si es necesario completar el cuadrado.

$$\int \frac{1}{x^2+6x+10}\,dx$$

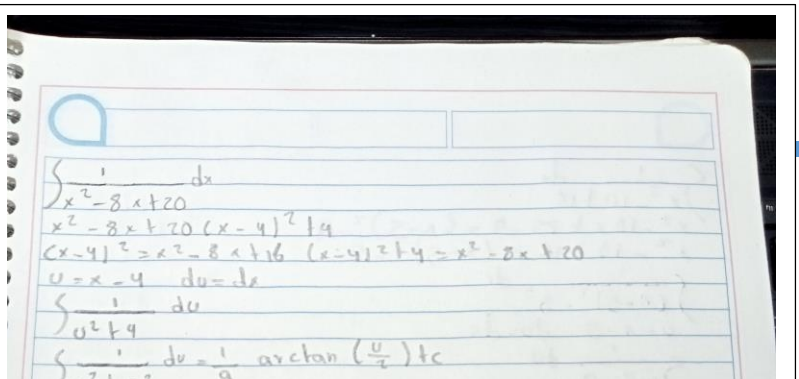
$x^2+6x+10=(x+3)^2+1$

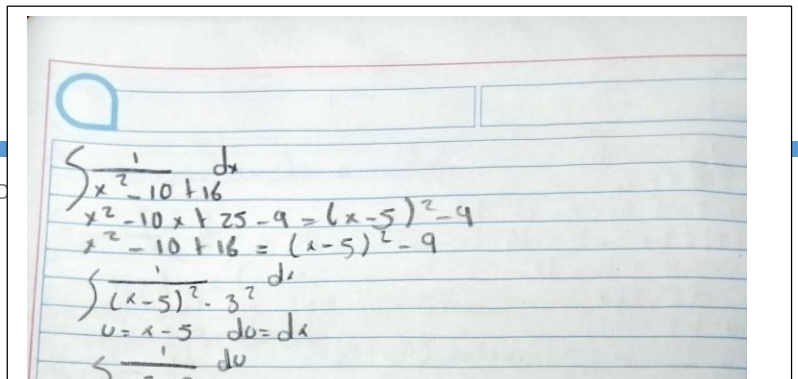
$(x+3)^2=x^2+6x+9 \quad x^2+6x+10=(x+3)^2+1$

$u=x+3 \quad du=dx$

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

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


$\int \frac{1}{x^2-8x+20}\,dx$
$x^2-8x+20 \quad (x-4)^2+4$
$(x-4)^2 = x^2-8x+16 \quad (x-4)^2+4 = x^2-8x+20$
$u = x-4 \quad du = dx$
$\int \frac{1}{u^2+4}\,du$
$\int \frac{1}{u^2+4}\,du = \frac{1}{2}\arctan\left(\frac{u}{2}\right)+c$


$\int \frac{1}{x^2-10+16}\,dx$
$x^2-10x+25-9=(x-5)^2-9$
$x^2-10+16=(x-5)^2-9$
$\int \frac{1}{(x-5)^2-3^2}\,dx$
$u=x-5 \quad du=dx$
$\int \frac{1}{}\,du$