(6) $\int e^{x-4}dx = e^{x-4}+C$

$\frac{1}{5}\int 5e^{5x}dx = \frac{1}{5}e^{5x}+C$

(7) $\int \frac{2}{1+9x^2}dx$

$\int \frac{f'(x)}{1+[f(x)]^2}dx = \operatorname{arctg} f(x)$

$\frac{2}{3}\int \frac{3}{1+(3x)^2}dx = \frac{2}{3}\operatorname{arctg} 3x + C$

$\int \frac{4\,dx}{3+3x^2} = \frac{1}{3}\int \frac{4\,dx}{1+x^2}dx$

$\frac{4}{3}\operatorname{arctg} x + C$

$\int \frac{2}{4+3x^2}dx$

mar 12-13:11

(8) $\int \frac{x^2-5x+4}{x+1}dx$

$x^2-5x+4 \;\big|\; x+1$

$-x^2-x \quad\quad x-6$

$-6x+4$

$6x+6$

10

$\int x-6+\frac{10}{x+1}dx$

$\frac{x^2}{2}-6x+10\ln|x+1|+C$

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

$2x^2+2x+4 \;\big|\; x+1$

$-2x^2-2x \quad\quad 2x$

4

$2\frac{x^2}{2}+4\ln|x+1|+C$

$x^2+4\ln|x+1|+C$

mar 12-13:14

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

$x^3-3x^2+x-1 \;\big|\; x-2$

$-x^3+2x^2 \quad\quad x^2-x-1$

$-x^2+x-1$

x^2-2x

$-x-1$

$x-2$

-3

$\int x^2-x-1-\frac{3}{x-2}dx$

$\frac{x^3}{3}-\frac{x^2}{2}-x-3\ln|x-2|+C$

mar 12-13:16

$\int \frac{dx}{\sqrt{1-4x^2}} = \int (1-4x^2)^{-1/2}dx$

$\int \frac{f'(x)}{\sqrt{1-[f(x)]^2}}dx = \operatorname{arcsen} f(x)+C$

$\frac{1}{2}\int \frac{1\cdot 2}{\sqrt{1-(2x)^2}}dx$

$\frac{1}{2}\operatorname{arcsen} 2x + C$

mar 12-13:17

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

$$\int \frac{e^x}{\sqrt{1-(e^x)^2}}\,dx$$

$$\arcsin e^x + C$$

mar 12-13:19

(14) $\int \cos x \sin^3 x\,dx = \int \cos x (\sin x)^3\,dx$

$\int f'(x) f(x)^n\,dx = \frac{f(x)^{n+1}}{n+1} + C$

$\frac{\sin^4 x}{4} + C$

$\int \frac{x}{(x^2+3)^5}\,dx = \frac{1}{2}\int 2x (x^2+3)^{-5}\,dx$

$\frac{1}{2}\,\frac{(x^2+3)^{-4}}{-4} + C = -\frac{1}{8(x^2+3)^4} + C$

mar 12-13:20

$\int \sin x \cos x\,dx$

$\int f(x)^4 f'(x)\,dx = \frac{f(x)^2}{2} + C$

$= \frac{\sin^2 x}{2} + C = \frac{-\cos^2 x}{2} + C_2$

$\frac{1-\cos^2 x}{2} + C$

$\int \frac{2x\,dx}{\sqrt{9-x^2}} = \int -2x (9-x^2)^{-1/2}\,dx$

$-\frac{(9-x^2)^{1/2}}{1/2} + C = -2\sqrt{9-x^2} + C$

mar 12-13:23

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

$f(x)^n$

$\frac{1}{2}\,\frac{(x^2-2x)^{3/2}}{3/2} + C = \frac{\sqrt{(x^2-2x)^3}}{3} + C$

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

$\int f'(x) f(x)^4\,dx$

$\frac{\arcsin^2 x}{2} + C$

mar 12-13:28

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

$\int f'(x)\,f(x)^n\,dx$

$\frac{(1+\ln x)^3}{3}+C$

$\int \sqrt{(1+\cos x)^3}\,\sin x\,dx$

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

$-\frac{(1+\cos x)^{5/2}}{5/2}+C = -\frac{2}{5}\sqrt{(1+\cos x)^5}+C$

mar 12-13:30

$\frac{1}{2}\int 2e^{2x}\,dx = \frac{1}{2}e^{2x}+C$

METODO DE SUSTITUCION

$\int e^{2x}\,dx$

$2x = t$

$2\,dx = 1\,dt \Rightarrow dx = \frac{dt}{2}$

$\int e^t \frac{dt}{2} = \frac{1}{2}\int e^t\,dt =$

$\frac{1}{2}e^t + C = \frac{1}{2}e^{2x}+C$

$\int \sqrt{1+\sin x}\cdot\cos x\,dx$

$1+\sin x = t$

$\cos x\,dx = 1.\,dt \rightarrow dx = \frac{dt}{\cos x}$

$\int \sqrt{t}\cdot\cos x\,\frac{dt}{\cos x} = \int t^{1/2}\,dt$

$\frac{t^{3/2}}{3/2}+C = \frac{2}{3}\sqrt{(1+\sin x)^3}+C$

mar 12-13:33

$\int x e^{2x^2}\,dx$

MODO 1 Inmediata.

$\int f'(x)e^{f(x)}\,dx = e^{f(x)}+C$

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

$\frac{1}{4}e^{2x^2}+C$

MODO 2 Sustitucion

$\int x e^{2x^2}\,dx$

$2x^2 = t \Rightarrow 4x\,dx = 1\,dt$

mar 12-13:37

$dx = \frac{dt}{4x}$

$\int x e^t \frac{dt}{4x} = \frac{1}{4}\int e^t\,dt$

$\frac{1}{4}e^t + C = \frac{1}{4}e^{2x^2}+C$

$t =$ "De lo que yo tengo lo derivada (o casi)"

mar 12-13:38

$\int x \cdot e^x dx$

Dos Func. que no tienen relación

$(u \cdot v)' = u' \cdot v + u \cdot v'$

$\int d(uv) = \int du \cdot v + \int u\, dv$

$u \cdot v = \int v\, du + \int u\, dv$

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

Un auto viaja con velocidad de uniforme

mar 12-13:40

SE HALLAR

$u \xrightarrow{\text{Derivar}} du$

$dv \xrightarrow{\text{Int.}} v = \int dv$

METODO INTEGRACION PARTES

	D	I
Polinom	D	I
Exp	D	I
log →	D	I
Trig	D	I
arcos →	D	I

u → log o arcos, Pol, Trig, Exp

mar 12-13:43

$\int x e^x dx$

u "dv"

$u = x \longrightarrow 1\, du = 1\, dx$

$dv = e^x dx \rightarrow v = \int e^x dx = e^x$

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

$\int x e^x dx = x e^x - \int e^x dx$

$x e^x - e^x + C$

$e^x (x-1) + C$

mar 12-13:47

Integrales con productos

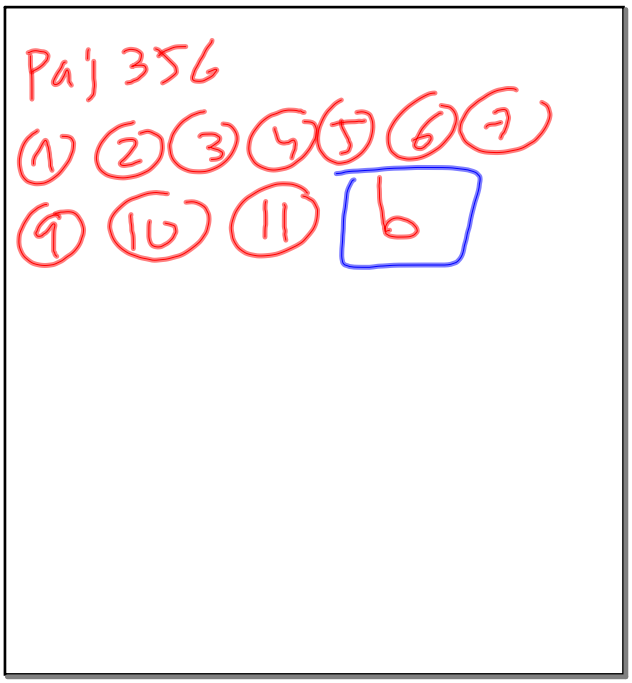
- Cuando tienen relación
  - Inmediata
  - Sustitución

  t = la func de la que tenga la derivada (o casi)
- Cuando no tienen relación
  Integración por partes

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

u | log, arcl, Polinomios, Trig, Exp.

mar 12-13:50



mar 12-13:53