MATEMÁTICAS – FIME – A2018

CALCULO DIFERENCIAL

$D_x(u)^n = n(u)^{n-1}du$

$D_x[u * v] = uD_xv + vD_xu$

$D_x\left[\frac{u}{v}\right] = \frac{vD_xu - uD_xv}{v^2}$

$D_x[lnu] = \frac{1}{u}D_xu$

$D_x\ [Log_a u] = \frac{1}{ulna}D_xu$

$D_x[e^u] = e^uD_xu$

$D_x[a^u] = a^u\ \ln a D_xu$

$D_x[Senu] = CosuD_xu$

$D_x[Cosu] = -SenuD_xu$

$D_x[Tanu] = Sec^2uD_xu$

$D_x[Cotu] = -Csc^2uD_xu$

$D_x[Secu] = SecuTanuD_xu$

$D_x[Cscu] = -CscuCotuD_xu$

$D_x[\ Senh^{-1}u] = \frac{D_xu}{\sqrt{u^2+1}}$

$D_x[\ Cosh^{-1}u] = \frac{D_xu}{\sqrt{u^2-1}}$

$D_x[\ Tanh^{-1}u] = \frac{D_xu}{1-u^2}$

$D_x[\ Coth^{-1}u] = \frac{D_xu}{1-u^2}$

$D_x[\ Sech^{-1}u] = \frac{-D_xu}{u\sqrt{1-u^2}}$

$D_x[\ Csch^{-1}u] = \frac{-D_xu}{|u|\sqrt{1-u^2}}$

$D_x[\ ArcSenu] = \frac{D_xu}{\sqrt{1-u^2}}$

$D_x[\ ArcCosu] = \frac{-D_xu}{\sqrt{1-u^2}}$

$D_x[\ ArcTanu] = \frac{D_xu}{1+u^2}$

$D_x[\ ArcCotu] = \frac{-D_xu}{1+u^2}$

$D_x[\ ArcSecu] = \frac{D_xu}{|u|\sqrt{u^2-1}}$

$D_x[\ ArcCscu] = \frac{-D_xu}{|u|\sqrt{u^2-1}}$

$D_x[Senhu] = Cosh(u)Du$

$D_x[Coshu] = Senh(u)Du$

$D_x[Tanhu] = Sech^2(u)Du$

$D_x[Cothu] = -Csch^2(u)Du$

$D_x[Sechu] = -Sech(u)Tanh(u)Du$

$D_x[Cschu] = -Csch(u)Coth(u)Du$

REGLAS BASICAS DE LA INTEGRACION

$\int dx = x + C$

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

$\int Kf(x)dx = K\int f(x)dx$ **K = cte**

$\int [f(x) \pm g(x)]dx = \int f(x) \pm \int g(x)dx$

CAMBIO DE VARIABLE

$\int u^n du = \frac{u^{n+1}}{n+1} + C$ $\mathbf{n \neq -1}$

En donde u es una función polinomial o trascendental

FUNCIONES EXPONENCIALES

$\int e^u du = e^u + C$

$\boldsymbol{e = Cte. de\ Euler = 2.718}$

$\int a^u du = \frac{a^u}{\ln a} + C$

FUNCION LOGARITMICA

$\int \frac{du}{u} = ln|u| + C$

Propiedades:

Ln (pq) = Ln p + Ln q

Ln e=1

$Ln\left(\frac{p}{q}\right) = Ln(p) - Ln(q)$

$Ln\ 1 = 0$ $e^{Ln\ (u)} = u$

$Ln\ p^r = r\ Ln\ p$

FUNCIONES TRIGONOMÉTRICAS

$\int Sen(u)du = -Cos(u) + C$

$\int Cos(u)du = Sen(u) + C$

$\int Tan(u)du = \ln|Sec(u)| + C$

$= -\ln|Cos(u)| + C$

$\int Cot(u)du = -\ln|Csc(u)| + C$

$= \ln|Sen(u)| + C$

$\int Sec(u)du = \ln|Sec(u) + Tan(u)| + C$

$\int Csc(u)du = \ln|Csc(u) - Cot\ (u)| + C$

$\int Sec^2(u)du = Tan(u) + C$

$\int Csc^2(u)du = -Cot(u) + C$

$\int Sec(u)Tan(u)du = Sec(u) + C$

$\int Csc(u)Cot(u)du = -Csc(u) + C$

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FUNCIONES HIPERBÓLICAS

$\int Senh(u)du = Cosh(u) + C$

$\int Cosh(u)du = Senh(u) + C$

$\int Tanh(u)du = ln|Cosh\, u| + C$

$\int Coth(u)du = ln|Senh\, u| + C$

$\int Sech^2(u)du = Tanh(u) + C$

$\int Csch^2(u)du = -Coth(u) + C$

$\int Sech(u)Tanh(u)du = -Sech(u) + C$

$\int Csch(u)Coth(u)du = -Csch(u) + C$

FUNCIONES TRIGONOMÉTRICAS INVERSAS

$\int \frac{du}{\sqrt{a^2 - u^2}} = Sen^{-1}\left(\frac{u}{a}\right) + C$

$\int \frac{du}{a^2 + u^2} = \frac{1}{a} Tan^{-1}\left(\frac{u}{a}\right) + C$

$\int \frac{du}{u\sqrt{u^2 - a^2}} = \frac{1}{a} Sec^{-1}\left(\frac{u}{a}\right) + C$

FUNCIONES HIPERBOLICAS INVERSAS

$\int \frac{du}{\sqrt{a^2 + u^2}} = Senh^{-1}\left(\frac{u}{a}\right) + C$

$\int \frac{du}{\sqrt{u^2 - a^2}} = Cosh^{-1}\left(\frac{u}{a}\right) + C$

$\int \frac{du}{u\sqrt{a^2 + u^2}} = \frac{-1}{a} Csch^{-1}\left(\frac{u}{a}\right) + C$

$\int \frac{du}{u\sqrt{a^2 - u^2}} = \frac{-1}{a} Sech^{-1}\left(\frac{u}{a}\right) + C$

$\int \frac{du}{a^2 - u^2} = \frac{1}{a} Tanh^{-1}\left(\frac{u}{a}\right) + C$

Forma equivalente de las integrales que dan como resultado

HIPERBÓLICAS INVERSAS

$\int \frac{du}{\sqrt{u^2 \pm a^2}} = \ln\left(u + \sqrt{u^2 \pm a^2}\right) + C$

$\int \frac{du}{a^2 - u^2} = \frac{1}{2a} ln\left|\frac{a+u}{a-u}\right| + C$

$\int \frac{du}{u\sqrt{a^2 \pm u^2}} = -\frac{1}{a} ln\left(\frac{a+\sqrt{a^2 \pm u^2}}{|u|}\right) + C$

SUSTITUCIÓN TRIGONOMÉTRICA

Forma $\rightarrow$ Sustitución $\rightarrow$ la raíz se sustituye por:

$\sqrt{a^2 - u^2} \rightarrow$ u= aSenθ $\rightarrow$ aCosθ

$\sqrt{a^2 + u^2} \rightarrow$ u= aTanθ $\rightarrow$ aSecθ

$\sqrt{u^2 - a^2} \rightarrow$ u= aSecθ $\rightarrow$ aTanθ

INTEGRAL POR PARTES

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

FRACCIONES PARCIALES

CASO I: Factores lineales distintos.

A cada factor lineal (ax + b) le corresponde una fracción de la forma:

$$\frac{A}{ax + b}$$

CASO II: Factores lineales repetidos.

A cada factor lineal repetido (ax + b)^k. Le corresponde la suma de k fracciones parciales de la forma:

$$\frac{A_1}{ax + b} + \frac{A_2}{(ax + b)^2} + \cdots + \frac{A_k}{(ax + b)^k}$$

CASO III. Factores cuadráticos distintos.

A cada factor cuadrático $(ax^2 + bx + c)$ le corresponde una fracción de la forma

$$\frac{Ax + B}{ax^2 + bx + c}$$

CASO IV. Factores cuadráticos repetidos.

A cada factor cuadrático repetido $(ax^2 + bx + c)^k$ le corresponde la suma de k fracciones parciales de la forma:

$$\frac{A_1x + B_1}{ax^2 + bx + c} + \cdots + \frac{A_kx + B_k}{(ax^2 + bx + c)^k}$$

TEOREMAS DE SUMATORIAS

Sean *m* y *n* enteros positivos, *c*= constante

1. $\sum_{i=1}^{n} c\, f(i) = c \sum_{i=1}^{n} f(i)$
2. $\sum_{i=1}^{n} [f(i) \pm g(i)] = \sum_{i=1}^{n} f(i) \pm \sum_{i=1}^{n} g(i)$
3. $\sum_{i=1}^{n} f(i) = \sum_{i=1}^{m} f(i) + \sum_{i=m+1}^{n} f(i) \quad m < n$
4. $\sum_{i=1}^{n} c = nc$
5. $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$
6. $\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$
7. $\sum_{i=1}^{n} i^3 = \left[\frac{n(n+1)}{2}\right]^2$

SUMA DE RIEMANN

$\int_a^b f(x)dx = \lim_{n\to\infty} \sum_{i=1}^{n} f(c_i)\Delta x$

$\Delta x = \frac{b-a}{n}$, $c_i = a + i * \Delta x$

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CASOS TRIGONOMETRICOS

	Tipo de Integral	Condición	Identidad útil
1	$\int Sen^n u\, du, \int Cos^n u\, du,$	donde n es un entero impar positivo	$Sen^2 u + Cos^2 u = 1$
2	$\int Sen^n u\, Cos^m u\; du,$	donde n o m es un entero impar positivo	$Sen^2 u + Cos^2 u = 1$
3	$\int Sen^n u\, du,$ $\int Cos^n u\, du,$ $\int Sen^n u\, Cos^m u\; du,$	donde n y m son enteros pares positivos	$Sen^2 u = \frac{1-Cos\, 2u}{2}$ $Cos^2 u = \frac{1+Cos\, 2u}{2}$ $Sen\, u\, Cos\, u = \frac{1}{2} Sen\, 2u$
4	$\int Sen\,(mu)\, Cos(nu) du$ $\int Sen\,(mu)\, Sen(nu) du$ $\int Cos\,(mu)\, Cos(nu) du$	donde n y m son cualquier número	$Sen\, A\, Cos\, B = \frac{1}{2}[Sen\,(A-B) + Sen\,(A+B)]$ $Sen\, A\, Sen\, B = \frac{1}{2}[\,Cos\,(A-B) - Cos\,(A+B)]$ $Cos\, A\, Cos\, B = \frac{1}{2}[\,Cos\,(A-B) + Cos\,(A+B)]$
5	$\int Tan^n u\, du,$ $\int Cot^n u\, du$	donde n es cualquier número entero	$1 + Tan^2 u = Sec^2 u$
6	$\int Sec^n u\, du,$ $\int Csc^n u\, du$	donde n es un entero par positivo	$1 + Tan^2 u = Sec^2 u$ $1 + Cot^2 u = Csc^2 u$
7	$\int Tan^m u\;\, Sec^n u\, du$ $\int Cot^m u\;\, Csc^n u\, du$	donde n es un entero par positivo	$1 + Tan^2 u = Sec^2 u$ $1 + Cot^2 u = Csc^2 u$
8	$\int Tan^m u\;\, Sec^n u\, du$ $\int Cot^m u\;\, Csc^n u\, du$	donde m es un entero impar positivo	$1 + Tan^2 u = Sec^2 u$ $1 + Cot^2 u = Csc^2 u$

CALCULO DE INTEGRALES DOBLES

$$\iint_R f(x,y) dA = \int_a^b \int_{g_1(x)}^{g_2(x)} f(x,y) dy dx \qquad \iint_R f(x,y) dA = \int_a^b \int_{g_1(y)}^{g_2(y)} f(x,y) dx dy$$

APLICACIONES DE LA INTEGRAL DEFINIDA

ÁREA:

$$A = \int_a^b [(Función\ de\ arriba) - (función\ de\ abajo)] dx$$

$$A = \int_a^b [(Función\ derecha) - (función\ izquierda)] dy$$

VOLUMEN / METODO DE CAPAS O CORTEZA

Cuando el eje de revolución es horizontal

$$V = 2\pi \int_a^b r(y) h(y) dy$$

Cuando el eje de revolución es vertical

$$V = 2\pi \int_a^b r(x) h(x) dx$$

VOLUMEN / METODO DEL DISCO O ARANDELA

V= $\pi \int_a^b [(R^2(x) - r^2(x)] dx$

V= $\pi \int_a^b [(R^2(y) - r^2(y)] dy$

LONGITUD DE ARCO

$$S = \int_a^b \sqrt{1 + [f'(x)]^2}\, dx$$

$$S = \int_c^d \sqrt{1 + [g'(y)]^2}\, dy$$

TRABAJO

$$\boldsymbol{W = \int_a^b F(x) dx}$$

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IDENTIDADES TRIGONOMÉTRICAS

INVERSAS

$Sen(u) = \frac{1}{Csc(u)}$ $\quad$ $Csc(u) = \frac{1}{Sen(u)}$

$Cos(u) = \frac{1}{Sec(u)}$ $\quad$ $Sec(u) = \frac{1}{Cos(u)}$

$Tan(u) = \frac{1}{Cot(u)}$ $\quad$ $Cot(u) = \frac{1}{Tan(u)}$

$Sen(-A) = -sen(A)$

$Cos(-B) = \cos(B)$

FORMA DE COCIENTE

$Tan(u) = \frac{Sen(u)}{Cos(u)}$ $\quad$ $Cot(u) = \frac{Cos(u)}{Sen(u)}$

PITAGÓRICAS

$Sen^2(u) = 1 - Cos^2(u)$

$Cos^2(u) = 1 - Sen^2(u)$

$Sec^2(u) = 1 + Tan^2(u)$

$Tan^2(u) = Sec^2(u) - 1$

$Csc^2(u) = 1 + Cot^2(u)$

$Cot^2(u) = Csc^2(u) - 1$

ANGULO DOBLE

Sen2u= 2Sen(u)Cos(u)

Cos2u = $Cos^2(u) - Sen^2(u)$

$Sen^2(u) = \frac{1-\cos(2u)}{2}$

$Cos^2(u) = \frac{1+\cos(2u)}{2}$

IDENTIDADES HIPERBÓLICAS

$cosh^2(u) - senh^2(u) = 1$

$sech^2(u) + tanh^2(u) = 1$

$coth^2(u) - csch^2(u) = 1$

$senh(2u) = 2senh(u)\cosh(u)$

$\cosh(2u) = cosh^2(u) + senh^2(u)$

$tanh(2u) = \frac{2\tanh(u)}{1+tanh^2(u)}$

$senh^2(u) = \frac{cosh(2u)-1}{2}$

$cosh^2(u) = \frac{cosh(2u)+1}{2}$

$senh\,x = \frac{e^x - e^{-x}}{2}$

$Cosh\,x = \frac{e^x + e^{-x}}{2}$

$Tanh\,x = \frac{senhx}{coshx}$

$Coth\,x = \frac{coshx}{senhx}$

$Senh\,xCschx = 1$

$Cosh\,xSechx = 1$

FUNCIONES TRIGONOMÉTRICAS

$Sen\theta = \frac{C.O.}{Hip}$ $\quad$ $Cot\theta = \frac{C.A.}{C.O.}$

$Cos\theta = \frac{C.A.}{Hip}$ $\quad$ $Sec\theta = \frac{Hip.}{C.A.}$

$Tan\theta = \frac{C.O.}{C.A.}$ $\quad$ $Csc\theta = \frac{Hip.}{C.O.}$

VALORES IMPORTANTES DEL SENO Y COSENO

$sen(0) = 0$

$sen\left(\frac{\pi}{2}\right) = 1$

$sen(\pi) = 0$

$sen\left(\frac{3}{2}\pi\right) = -1$

$sen(2\pi) = 0$

$sen(n\pi) = 0$

$sen\left[(2n-1)\frac{\pi}{2}\right] = -(-1)^n = (-1)^{n+1}$

$sen\left(\frac{\pi}{6}\right) = \frac{1}{2}$

$sen\left(\frac{\pi}{3}\right) = \frac{\sqrt{3}}{2}$

$sen\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$

$sen\left[(1+4n)\frac{\pi}{2}\right] = 1$

$cos\left[(1 \pm 4n)\frac{\pi}{2}\right] = 0$

$cos(0) = 1$

$cos\left(\frac{\pi}{2}\right) = 0$

$cos(\pi) = -1$

$cos\left(\frac{3}{2}\pi\right) = 0$

$cos(2\pi) = 1$

$cos(2n\pi) = 1$

$cos\left[(2n-1)\frac{\pi}{2}\right] = cos\left[(1-2n)\frac{\pi}{2}\right] = 0$

$cos(n\pi) = (-1)^n$

$cos[(1 \pm 2n)\pi] = -1$

$cos\left(\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$

$cos\left(\frac{\pi}{3}\right) = \frac{1}{2}$

$cos\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$

$cos[(1 \pm n)\pi] = -(-1)^n$

$Cos\,(t) = \frac{1}{2}(e^{jt} + e^{-jt})$ $\quad$ $e^{\pm jt} = Cos(t) \pm jSen\,(t)$

$Sen\,(t) = \frac{1}{2j}(e^{jt} - e^{-jt})$

LEYES DE EXPONENTES

$a^m a^n = a^{m+n}$ $\quad$ $\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$

$(a^m)^n = a^{mn}$ $\quad$ $a^{-n} = \frac{1}{a^n}$

$(ab)^m = a^m b^m$ $\quad$ $a^{\frac{p}{q}} = \sqrt[q]{a^p}$

$\frac{a^m}{a^n} = a^{m-n} \quad m > n$ $\quad$ $a^0 = 1$

$\frac{a^m}{a^n} = \frac{1}{a^{n-m}} \quad m < n$

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TRANSFORMADAS DE LAPLACE

TABLA DE TRANSFORMADAS ELEMENTALES

	f(t)	F(s)
1	C	$\frac{C}{s}, s > 0$
2	t	$\frac{1}{s^2}, s > 0$
3	t^n	$\frac{n!}{s^{n+1}}, s > 0$
4	e^{at}	$\frac{1}{s-a}, s > a$
5	$Sen\ at$	$\frac{a}{s^2+a^2}, s > 0$
6	$Cos\ at$	$\frac{s}{s^2+a^2}, s > 0$
7	$Senh\ at$	$\frac{a}{s^2-a^2}, s > \|a\|$
8	$Cosh\ at$	$\frac{s}{s^2-a^2}, s > \|a\|$
9	$t^n e^{at}$	$\frac{n!}{(s-a)^{n+1}}$
10	$e^{bt} Sen\ at$	$\frac{a}{(s-b)^2+a^2}$
11	$e^{bt} Cos\ at$	$\frac{s-b}{(s-b)^2+a^2}$
12	$e^{bt} Senh\ at$	$\frac{a}{(s-b)^2-a^2}$
13	$e^{bt} Cosh\ at$	$\frac{s-b}{(s-b)^2-a^2}$

Transformada de la derivada

$$\mathcal{L}\{f^{(n)}(t)\} = s^n F(s) - s^{n-1} f(0) - s^{n-2} f'(0) - \cdots - s f^{(n-2)}(0) - f^{(n-1)}(0)$$

Transformada de la Integral

$$\mathcal{L}\left\{\int_0^t f(t)dt\right\} = \frac{F(s)}{s}$$

Multiplicación por t^n

$$\mathcal{L}\{t^n f(t)\} = (-1)^n F^{(n)}(s)$$

Primera Propiedad de Traslación

$$\mathcal{L}^{-1}\{F(s-a)\} = e^{at} f(t)$$

Transformada Inversa de la Derivada

$$\mathcal{L}^{-1}\{F^{(n)}(s)\} = (-1)^n t^n f(t)$$

División por s

$$\mathcal{L}^{-1}\left\{\frac{F(s)}{s^n}\right\} = \int_0^t \dots \int_0^t f(t)(dt)^n$$

Teorema de Convolución o Transformada Inversa del Producto

Si $\mathcal{L}^{-1}\{F(s)\} = f(t)$ y $\mathcal{L}^{-1}\{G(s)\} = g(t)$, *entonces:*

$$\mathcal{L}^{-1}\{F(s)G(s)\} = \int_0^t f(u)g(t-u)du = \int_0^t f(t-u)g(u)du$$

TABLA DE TRANSFORMADAS INVERSAS ELEMENTALES

	F(s)	f(t)
1	$\frac{C}{s}$	C
2	$\frac{1}{s^2}$	t
3	$\frac{1}{s^{n+1}}$	$\frac{t^n}{n!}$
4	$\frac{1}{s-a}$	e^{at}
5	$\frac{1}{s^2+a^2}$	$\frac{Sen\ at}{a}$
6	$\frac{s}{s^2+a^2}$	$Cos\ at$
7	$\frac{1}{s^2-a^2}$	$\frac{Senh\ at}{a}$
8	$\frac{s}{s^2-a^2}$	$Cosh\ at$
9	$\frac{1}{(s-a)^{n+1}}$	$\frac{t^n e^{at}}{n!}$
10	$\frac{1}{(s-b)^2+a^2}$	$\frac{e^{bt} Sen\ at}{a}$
11	$\frac{s-b}{(s-b)^2+a^2}$	$e^{bt} Cos\ at$
12	$\frac{1}{(s-b)^2-a^2}$	$\frac{e^{bt} Senh\ at}{a}$
13	$\frac{s-b}{(s-b)^2-a^2}$	$e^{bt} Cosh\ at$

SERIES DE FOURIER

$$f(t) = \frac{1}{2}a_0 + \sum_{n=1}^{\infty}[a_n \cos(n\omega_0 t) + b_n \operatorname{sen}(n\omega_0 t)]$$

Fórmula General $f(t) = \frac{1}{2}a_0 + \sum_{n=1}^{\infty}[a_n \cos(n\omega_0 t) + b_n \operatorname{sen}(n\omega_0 t)]$	$a_0 = \frac{2}{T}\int_{-T/2}^{T/2} \mathrm{f(t)}\, dt$	$a_n = \frac{2}{T}\int_{-T/2}^{T/2} \mathrm{f(t)}\cos(n\omega_0 t)dt$	$b_n = \frac{2}{T}\int_{-T/2}^{T/2} \mathrm{f(t)}\operatorname{sen}(n\omega_0 t)dt$
Simetría Par $f(t) = \frac{1}{2}a_0 + \sum_{n=1}^{\infty}[a_n \cos(n\omega_0 t)]$	$a_0 = \frac{4}{T}\int_{0}^{T/2} \mathrm{f(t)}\, dt$	$a_n = \frac{4}{T}\int_{0}^{T/2} \mathrm{f(t)}\cos(n\omega_0 t)dt$	$b_n = 0$
Simetría Impar $f(t) = \sum_{n=1}^{\infty}[b_n \operatorname{sen}(n\omega_0 t)]$	$a_0 = 0$	$a_n = 0$	$b_n = \frac{4}{T}\int_{0}^{T/2} \mathrm{f(t)}\operatorname{sen}(n\omega_0 t)dt$
Simetría de Media Onda $f(t) = \sum_{n=1}^{\infty}[a_{2n-1}\cos((2n-1)\omega_0 t) + b_{2n-1}\operatorname{sen}((2n-1)\omega_0 t)]$	$a_0 = 0$ $a_{2n} = 0$ $b_{2n} = 0$	$a_{2n-1} = \frac{4}{T}\int_{0}^{T/2} \mathrm{f(t)}\cos[(2n-1)(\omega_0 t)]dt$	$b_{2n-1} = \frac{4}{T}\int_{0}^{T/2} \mathrm{f(t)}\operatorname{sen}[(2n-1)(\omega_0 t)]dt$
Simetría de un cuarto de onda Par $f(t) = \sum_{n=1}^{\infty}[a_{2n-1}\cos((2n-1)\omega_0 t)]$	$a_0 = 0$ $a_{2n} = 0$	$a_{2n-1} = \frac{8}{T}\int_{0}^{T/4} \mathrm{f(t)}\cos[(2n-1)(\omega_0 t)]dt$	$b_n = 0$
Simetría de un cuarto de onda Impar $f(t) = \sum_{n=1}^{\infty}[b_{2n-1}\operatorname{sen}((2n-1)\omega_0 t)]$	$a_0 = 0$ $b_{2n} = 0$	$a_n = 0$	$b_{2n-1} = \frac{8}{T}\int_{0}^{T/4} \mathrm{f(t)}\operatorname{sen}[(2n-1)(\omega_0 t)]dt$

Serie De Fourier (FORMA COMPLEJA)	**Si se conoce a_n, a_0 y b_n se obtiene:**	**Si se conoce C_n, C_0 se obtiene:**	
$C_n = \frac{1}{T}\int_{-T/2}^{T/2} f(t)e^{-jnWot}dt$ $f(t) = \sum_{n=-\infty}^{\infty} C_n\, e^{jnWot}$ n= 0±1±2±3…	$C_n = \frac{1}{2}(a_n - jb_n)$ $C_0 = \frac{1}{2}a_0$	$a_n = 2Re[C_n]$ $b_n = -2Im[C_n]$ $a_0 = 2C_0$	$\omega o = \frac{2\pi}{T}$ RV7