Analyse 2-CMS-Résumé

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Angle: 0-, 5+, L= a.r, A=1.a.r2, w: vitesse angulaire [rad.s], a(t)=w.t,
 V= w , T= = = 2 T , 1 tour = 360° = 2 T , x - 180 [deg] , x - T [rad.] ,
 Cercle trigo: tand = sind cota = cosa cota = tona
              0° 30° 45° 60° 90° cos a: R -> [-1;1], sina: R -> [-1;1],
             11 11 11 11 11
O T/6 T/4 T/3 T/2
                                                              COS & = COS (-a) (paire), - Sind = Sin (-d) (impaire),
             0 1/2 12/2 13/2 1
                                                               - tand = tan(-a) (impaire), - cota = cot(-a) (impaire),
 Sin
              1 53/2 52/2 1/2 0
                                                             CAH SOH TOA, sin(1/2-0) = cos d,
 COS
              0 \( \bar{3}/3 \) 1 \( \bar{3} \)
                                                                COS(T/2-a) = Sina, tan(t/2-a) = cota
 tan
             0 13 1 13/3 0
                                                                Cot (1/2-0) = tand.
 cot
 \cos(\pi-\alpha)=-\cos\alpha, \sin(\pi-\alpha)=\sin\alpha, \tan(\pi-\alpha)=-\tan\alpha, \cot(\pi-\alpha)=-\cot\alpha
 Réciproques: Sind= x x, der s={arcsin x +2km, TT-arcsin x+2kt}, (KEIL),
 COS & = X X, LER S= {arccos X + 2 KT, -arccos X + 2 KT}, tand = X S= {arctan c + kT}
 \cot x = x  S = \{ \operatorname{arccotc} + k \cdot \pi \}, \operatorname{arcsin} : [-1;1] \rightarrow [-\frac{\pi}{2}; \frac{\pi}{2}], \operatorname{arccos} : [-1;1] \rightarrow [0, \pi],
\arctan: \mathbb{R} \to \mathbb{I} - \mathbb{Z}; \mathbb{Z}[, \operatorname{arccot}: \mathbb{R} \to \mathbb{I}0; \mathbb{T}[, \sin(\operatorname{arcsin}(x)) = x \cos(\operatorname{arccos}(x)) = x \forall x \in \mathbb{Z}^{-1}; \mathbb{Z}]
tan (arctan (y))= y cot (arccot (y))= y ty ER, arcsin(sin(a))= a ta E [==; =],
arccos (cos(a))= a tae[o: T], arctan(tan(a))= a tae]-T; T[, arccot(cot(a))= a tae]o. T[
Formules: cos2 + sin2 = 1, 7 = 7+tan2 , sin2 = 1+cot2 , cos(at8)=cosa.cosB=sina.sin8,
Sin(a\pm B)=Sin\alpha \cdot CoSB\pm coS\alpha \cdot SinB, tan(a\pm B)=\frac{tan\alpha\pm tanB}{1\mp tan\alpha tanB}, Cot(a\pm B)=\frac{(1\mp cot\alpha\cdot cotB)}{cot\alpha\pm cotB}
 Sin(2\alpha) = 2 Sin\alpha \cdot cos \alpha, cos(2\alpha) = cos^2 \alpha - Sin^2 \alpha, tan(2\alpha) = \frac{2 tan \alpha}{1 - tan^2 \alpha}, cot(2\alpha) = \frac{cot^2 \alpha - 1}{2 cot \alpha}
\cos^{2}(\frac{\alpha}{2}) = \frac{1 + \cos \alpha}{2}, \sin^{2}(\frac{\alpha}{2}) = \frac{1 - \cos \alpha}{2}, \tan^{2}(\frac{\alpha}{2}) = \frac{1 - \cos \alpha}{1 + \cos \alpha}, \cot^{2}(\frac{\alpha}{2}) = \frac{1 + \cos \alpha}{1 - \cos \alpha}
 sin \alpha \pm sin \beta = 2 sin \left(\frac{\alpha \pm \beta}{2}\right) \cdot cos \left(\frac{\alpha + \beta}{2}\right), cos \alpha + cos \beta = 2 cos \left(\frac{\alpha + \beta}{2}\right) \cdot cos \left(\frac{\alpha - \beta}{2}\right), cos \alpha - cos \beta = -2 sin \left(\frac{\alpha + \beta}{2}\right) \cdot cos \left(\frac{\alpha - \beta}{2}\right)
Sind \cdot cosB = \frac{Sin(\alpha+B) + Sin(\alpha-B)}{2}, \quad cosa \cdot cosB = \frac{cos(\alpha+B) + cos(\alpha-B)}{2}, \quad sind \cdot sinB = -\frac{cos(\alpha+B) - cos(\alpha-B)}{2}
Harmoniques: c= VA2+B2, cosP=A, sinP=B, tanP=B
 A. Sin(wt+P) + B. cos(wt+P) = C. cos(wt-P) (par ex)
Bioche: R(sinx, cosx), (x +>-x) Z:= cosx sin2x=1-Z2, (x ←> T-x) Z:= sinx cos2x=1-Z2
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 $(X \leftrightarrow \pi + X)$ 2:=tan \times sin² $\times = \frac{2^2}{1+2^2}$ Cos $X = \frac{1}{1+2^2}$ Atester $X = \frac{\pi}{2} + K\pi$ (sinon) 2:=tan($\frac{X}{2}$) $tan \times = \frac{2Z}{1-7^2}$ $cos \times = \frac{1-Z^2}{1+Z^2}$ $sin \times = \frac{2Z}{1+Z^2}$ A tester $x = \pi + 2k\pi$ $sol. \times = 2 \arctan(z_i) + 2k\pi$ Triangles: a+B+x=#, a>B>x = a>b>c 0, a<b+c 0, a=b+c-2bc.cosa0, $A = \frac{1}{2} a - b - \sin \theta$ $\Rightarrow \frac{2A}{a - b - c} = \frac{\sin \theta}{c} = \frac{\sin \theta}{c} = \frac{\sin \theta}{c} = \frac{\cos \theta}{\sin \theta} = \frac{\cos \theta}{\sin \theta} = \frac{\cos \theta}{\cos \theta} = \frac$ Dérivabilité: $\sin' x = \cos x$, $\cos' x = -\sin x$, $\tan' x = 1 + \tan^2 x = \frac{1}{\cos^2 x}$, $\cot' x = -1 - \cot^2 x = -\frac{1}{\sin^2 x}$ $\arcsin' x = \frac{1}{\sqrt{1-x^2}}$, $\arccos' x = -\frac{1}{\sqrt{1-x^2}}$, $\arctan' x = \frac{1}{1+x^2}$, $\arccos' x = -\frac{1}{1+x^2}$ Logarithme: (F(t)=1), In: R+ -> R, Inx=5xdt In(1)=0, In(1)=-Inx, In(x1-x2)=Inx+1nx2, In (x1) = Inx, -Inx2, In(x8) = y Inx (yER, x1x2,x>0), In: strictement croissante/continue/dérivable, $\ln x = \frac{1}{x}$, $\ln (e) = 1$, $e = \sum_{k=1}^{\infty} \frac{1}{k!} = \lim_{n \to \infty} (n + \frac{1}{n})^n$

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Log. et exp.: Logb: R +→R logb(a) = x + expb(x) = a +1+b >0, logb(a) = lo(a)
\frac{d}{dx} \log_b(x) = \frac{1}{x \cdot \ln(b)}, \exp_b: \mathbb{R} \rightarrow \mathbb{R}^* \exp_b(x) = \exp(\ln(b) \cdot x) = e^{x \cdot \ln b} = b^x \forall b > 0,
\frac{d}{dx} a^{x} = a^{x} \cdot \ln(a), f^{y}(x) = \exp\left(\ln(F(x)) \cdot g(x)\right) = F(x)^{g(x)}, \exp\left(-x\right) = \frac{1}{\exp(x)}, \exp\left(x+y\right) = \exp(x) \cdot \exp(y),
exp. est croissante et continue, lim exp(x)=0, exp(-x). exp(x)=1, exp(0)=1, bx+x==bx.bx)
b^{x_1-x_2} = \frac{b^{x_1}}{L^{x_2}}, exp_b(x) = exp_1(-x), exp_b(x) \cdot exp_c(x) = exp_b.c(x), (a^b)^c = a^{bc}, \ln(a^x) = x \cdot \ln(a),
logb (1)=0, logb (x)=-log &(x), loga (bc)=c loga (b), dx F-1(x)= 1/F(F-1(x))
Fonctions hyperboliques: paire: F(-x)=F(x), impaire: F(-x)=-F(x), \cosh(x)=\frac{e^x+e^{-x}}{2},
 \cosh^{-1}(x) = \ln(x + \sqrt{x^2 - 1}) (R_{+} \rightarrow [1, +\infty[), \sinh(x) = \frac{e^{x} - e^{-x}}{2} (bijectif), \sinh^{-1}(x) = \ln(x + \sqrt{x^2 + 1})
cosh paire / sinh impaire, cosh(0)=1/sinh(0)=0, cosh>sinh, cosh2(x)-sinh2(x)=1,
\sinh(x) = \cosh(x)/\cosh(x) = \sinh(x), \tanh: \mathbb{R} \to \mathbb{R} x \mapsto \frac{\sinh(x)}{\cosh(x)}, \coth: \mathbb{R}^* \to \mathbb{R} x \mapsto \frac{\cosh(x)}{\sinh(x)}
tanh et coth impaires, tanh (0)=0, coth > tanh, tanh (x)=1-\frac{1}{\cosh^2(x)}, tanh (x)=\frac{1}{\cosh^2(x)},
 coth'(x) = -\frac{1}{sinh^{2}(x)}, tanh^{-1}(x) = \frac{1}{2} ln(\frac{1+x}{1-x}) (x 6]-1;1[), coth^{-1}(x) = \frac{1}{2} ln(\frac{x+1}{x-1}) (x E[-1;1])
Complexes: C = \{xI_2 + y_i : x, y \in \mathbb{R}\}\ i = \binom{0.7}{10}, 2 = x + iy x : partie réelle y : partie complexe,
Z=x-iy, |z|=|z|=√x2+y2=√2·z/z+0 → |z|+0, Re(z)=1/2 (z+2), |z·z'|=|z|·|z'|,
Zz' = Z·Z', z'= 1/21 Z, |z'|=1/21, bijection avec R2: z+z'= (x+x')/z·z'=(x-y)(x'),
polaire: Z=x+iy=[1z1; 0], z=1z1 (coso+isino), 0=argz, argz=-argz mod 211,
arg(-Z)=π+argz mod 2π, argz = {2 arctan( \( \frac{1}{121+x} \) si Z = -121 \( \frac{1}{2} \) Z Z'=[[-S; θ+ \( \text{mod 2π} \)],
Z^{-1} = \begin{bmatrix} \frac{1}{121} ; -arg_2 \mod 2\pi \end{bmatrix}, |Z| = r, [r^n, n\theta] = [r, 0] \Leftrightarrow \begin{cases} r^n = 1 & r > 0 \\ n\theta = 0 \mod 2\pi \end{cases} \quad \theta \in J - \pi; \pi [
Polynomes: P(x) = = ak xk, deg(P+a) ≤ max(degP, dega), deg(P-a) = degP+dega,
P=QM+R degR<degQ, idéal: YP,QEI:P+QEI et YPEI YQEKEXI:PxQEI,
MP, a= {AP+Bal A, B Elkex} = PGDC(P,Q)·KEXI, Pest irréductible ssi.: degP=1 ou degP=2
\Delta p < 0, éléments simples: \frac{P(x)}{Q(x)} = M(x) + \frac{R(x)}{Q(x)} si de q P \ge de q Q et on Factorise Q(x) pour
obtenir par ex.: \frac{R(x)}{Q(x)} = \frac{An}{x-\alpha} + \frac{A_2}{(x-\alpha)^2} + \frac{B_1x + C_1}{x^2 + 2\alpha x + b} = identification ou évaluation, viête:
(deg.3) ao=-a3([1.[2.[3]/an=a3([1,[2+[2[3+[1][3]/az=-a3([1+[2+[3])/+ a3x3+a2x2+a1x+a0=0
Application dérivées: dévelopement limité: dlf, xo (x) = \( \frac{\text{p}}{k!} \) (x-xo)^k, EDOL1h:
 y' + py = 0 \rightarrow y(x) = \lambda \exp(-\int_{x_0}^{x} p(s) ds) = \lambda Y_h(x) \quad y(x_0) = \lambda, EDOL1: y' + py = q
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-> y(x) = Pp(x) + A Ph(x) où Th(x) = exp(-Jxp(t) &t): il Faut deviner Yp(x): p, q constantes -> 1p(x)= 9/p, q ER[x] 1p(x) ER[x] deg 1p = deg q - deg p/ q= Acosx + Bsinx -> y= Acosx + Bsinx et y'= Asinx + Bcosx additionner yety regarder les coef. de l'EDOL/ $P_P(x) = \left(\int_{x_0}^{x} \frac{q(t)}{P_h(t)} dt\right) P_h(x)$