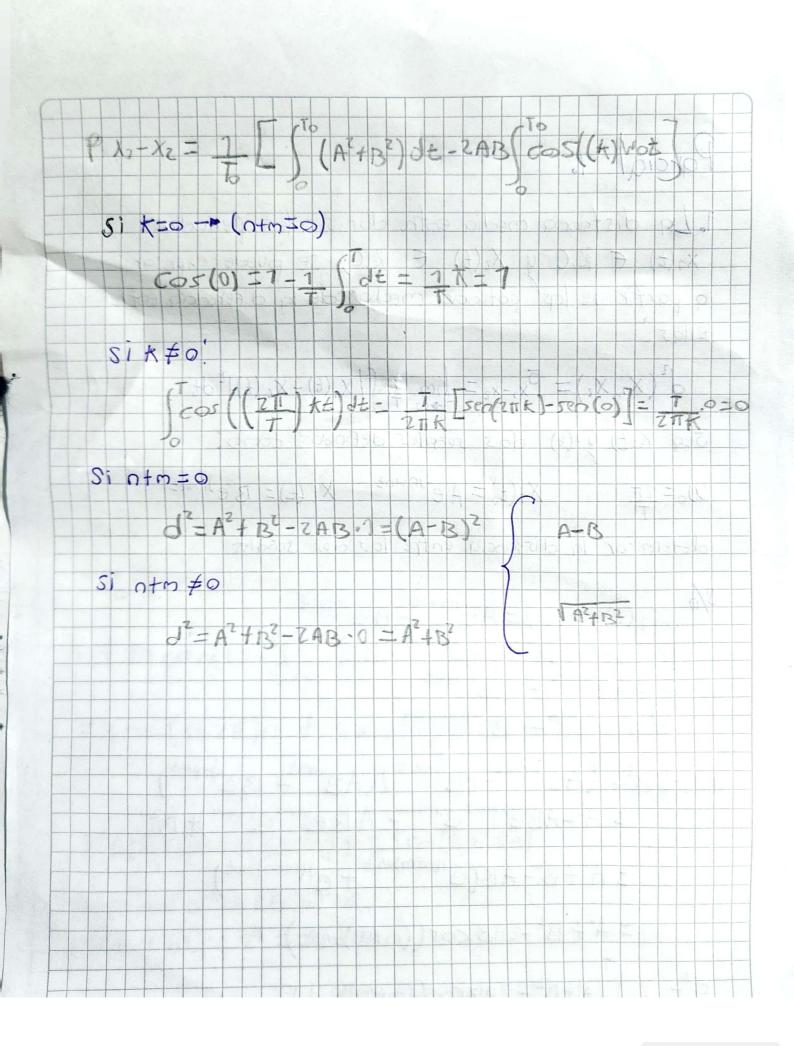
Parcial 1. 1. La distancia media entre dos senales periodicas X1(t) E R,C y X2(t) E R,C, SP puede expressor a partir de las potencia media de la diferencia entre ellas. $d^{2}(X_{1}, X_{2}) = \bar{P}_{X_{1}-X_{2}} = \lim_{t \to \infty} \frac{1}{T} \left\{ \left| X_{1}(t) - X_{2}(t) \right|^{2} dt \right\}$ Jeg X7(t) yx(e) dos retales definidos como: $W_0 = \frac{2\pi}{T}$ $X_7(t) = A e^{-j n wot}$ $X_1(t) = B e^{j m wot}$ deferminar la disfancia entre las dos señales S/0 X1(t)- x2(t) = A e jowet - B e jourst (X,(E)-X,(E)12= | A e inwot - Be inwo -Z*=Aeinhot - Rejoulot 1x2-X212 = (Ae invot Be invot)(Ae invot Be invot = AZ-ABEJONOTE JONOS - ABEJONOS + BZ = A2+B2-AB(e)(ntm)wot + e)(ntm)wot) = A2 + B2 - 2AB cos ((0+m) Wot) d= 1 (AL+BL-ZABCOS((O+M)WOL) d's AtB= 2AB (cor (ntm) Wat dt

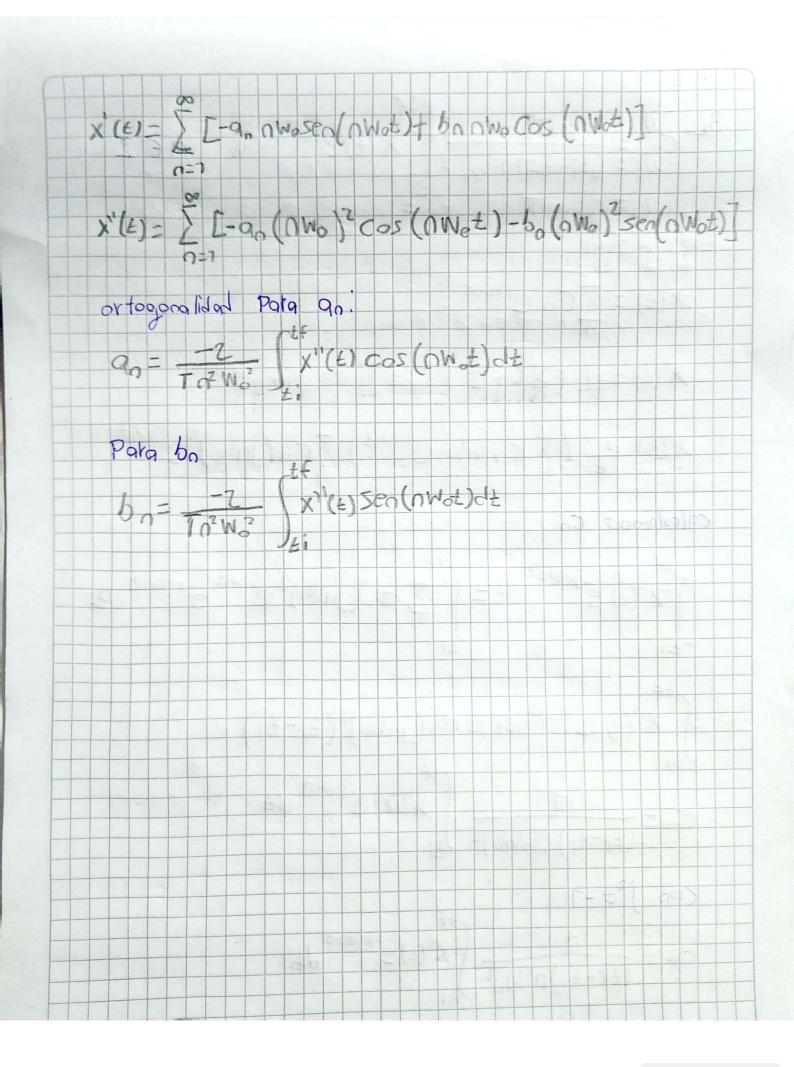


2. W1=1000TT F,=70008/2TV = 500H2 $w_2 = 3000 \, \text{T}$ $F_2 = 3000 \, \text{K/2} \, \text{K} = 1500 \, \text{Kz}$ W3=17000TT F3=17000X/2X = 6500H2 f, = 5 kH = 5000 Hz Segon Nyquist - for > 2 Frox 27 max = 77000 1/2 7 fs = 5000 /12 No comple Nyquist -fe=|f-kf=1 fe=15500 x2 - 5000 /1 = 500 M2 x[n]=3cos(2T. 500 n)+5 Jen(2T. 1500 n) +10 cos(210 000 n) =3 cas (0,211)n + 5 sen (0,611n) + 10 eos (2,211) 10 cos (0,2tr) X[0]=13cos(0,2TO) + 5500(0,6 TO) Applitud = 13 +5 = 18 para 4 bits the 16 niveles

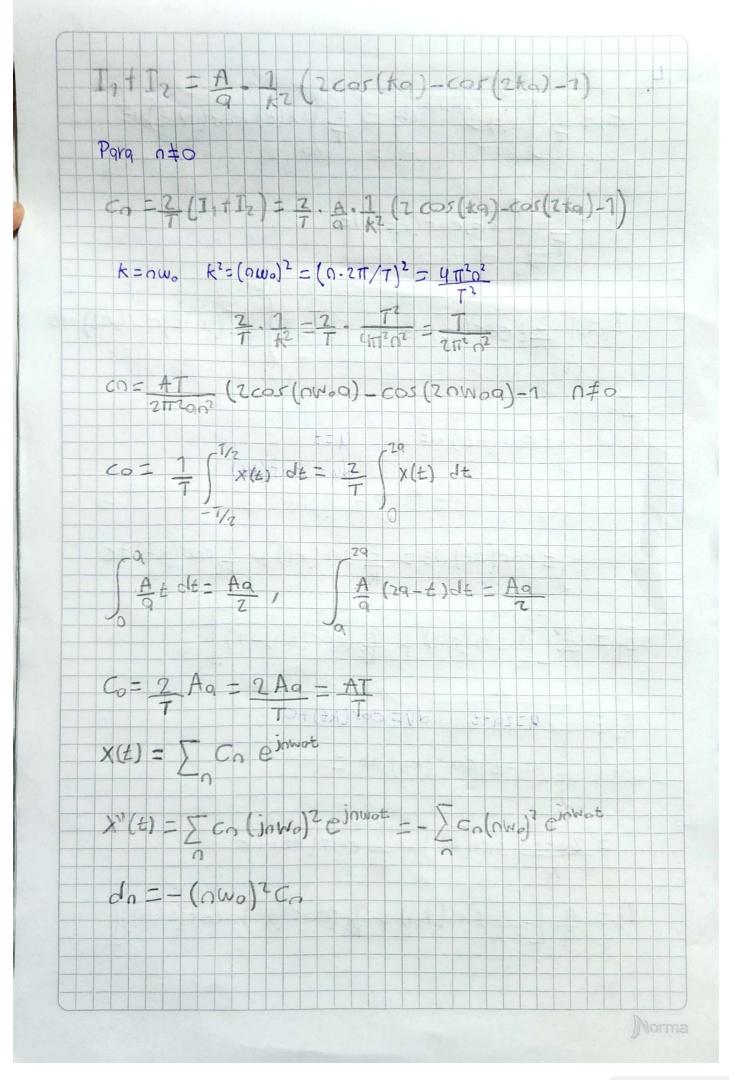
3.
$$C_0 = \frac{1}{(t_1^2 - t_1^2)\Omega^2 N_0^2} \int_{t_1}^{t_2^2} \frac{x^2(t)e^{inNot}}{x^2(t)} dt$$

Expandicalo.

 $x(t) = \sum_{n=1}^{\infty} C_n e^{inNot}$
 $x^2(t) = \frac{N}{n} \left(\sum_{n=1}^{\infty} C_n e^{inNot}\right) = \sum_{n=1}^{\infty} C_n \left(j_n N_0\right)^2 e^{j_n N_0 t}$
 $x^2(t) = \frac{N}{n} \left(\sum_{n=1}^{\infty} C_n e^{inNot}\right) = \sum_{n=1}^{\infty} C_n \left(j_n N_0\right)^2 e^{j_n N_0 t}$
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 $x^2(t) = \sum_{n=1}^{\infty} c_n \left(j_n N_0\right)^2 \left(\sum_{n=1}^{\infty} c_n e^{inNot}\right) = \sum_{n=1}^{\infty} c_n \left(j_n N_0\right)^2 e^{j_n N_0 t}$
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x(=) einwot of = = = (x(t) cos(nvot) de x(e)cost (ke) dt A (20-t) cos(+1) dt At 605 (Kt) dt tcos(At) dt u=t dy = cos (kt) t cos(kt)dt = t sin(kt) + 1 cos(kt) + c $I_1 = A \left[a \sin(ka) + \frac{1}{k^2} (\cos(ka) - 1) \right]$ 4-29-1 dys cor(kt)+C 10 - £ 1005 (+ £) dt = sin(tt) = 1 cos(tt)+c - 9 sin(ka) + 1 (cos(ka) - cos(2ka))



do = - 12 2. A.] (2005(ta)-005(2ka)-7) = - ZA (2 cos(ka) - cos(2ka) - 7) 2 cos 0 - cos 20 - 7= 4 cos & sin (9) 0 = nwoq dn = - 8A cos (nwoa) sin (nwoa) nto 0=0 (dal = 8/A/ 1 cos (nuoa) / sinz (nuoa) 0,70 d, <0 100 = 1 T indefinida do =0 como d= da - 0= 12,3,4,5 0=0 do = _ 87 (05 (80) 510 (80)

kaggle

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