Heefgebe 13  $- \frac{1}{3} = \sum_{k=1}^{4} \frac{\partial \mathcal{L}}{\partial q_{k}} \frac{\partial h_{k}}{\partial \alpha} \Big|_{\alpha=0} - \frac{\partial \mathcal{X}}{\partial \alpha} \Big|_{\alpha=0}$ L'= L+ det I F = -9xx -> V = = 2x2 al X = x + a cos(wf) L'= T-U = 2 m x" - 2 2 x" = 2m(x2-2x2cosin(o+)+d2.5in2(cs4) w2) - 1 /2 (x2+7x2 Cos(w))+22cos2(w+))=1+ =1 X dt = (- xd wsin(w)) + d = sin2(cx) w? )m dt (- xd cos(w)) + d = cos? cw)) R J(q, q, t) = 2 24 3hx | = - [2(-x2wmsin(w1)) | 1=0 + 2cm2d25im2(wf) w3) | = 2 (xd 2 cos cof)) | = 2 d | d=0  $t^{2}(\frac{k}{2}d^{2}\cos^{2}(cot)R)dt = const. \int \frac{5e}{da} \frac{euch stech}{5e} \chi_{1} \frac{1}{2} \frac{de}{da}$ 1 fallt weg. de = -x9d cos(wt) - mxd w sin(ws) Betroche nun: =- xx & cos(co+1- x xx sin(co+1) | Dex | W= m =7 =-x 2 cos(w+1 - x 2 sim (w+) X = -9 | X cos(w+1+x sim(w+1) df= - 9x x sin (est ) -- wmx sim(wH)