Modules mutivariate Chan rule In lost module, we saw somothing Called the That derivative, which slowed a shat war we have a muthinarable flenchen, (2,4,2) but variable shometimes each afterchan of some additional vonable t and if we want to calculate the derivative of the week want to calculate the derivative of the second of the constant of the c $f(x,y,z) = \sin(x)e^{yz^2}$ x = t - 1; $y = t^2$; z = thus Exposion:

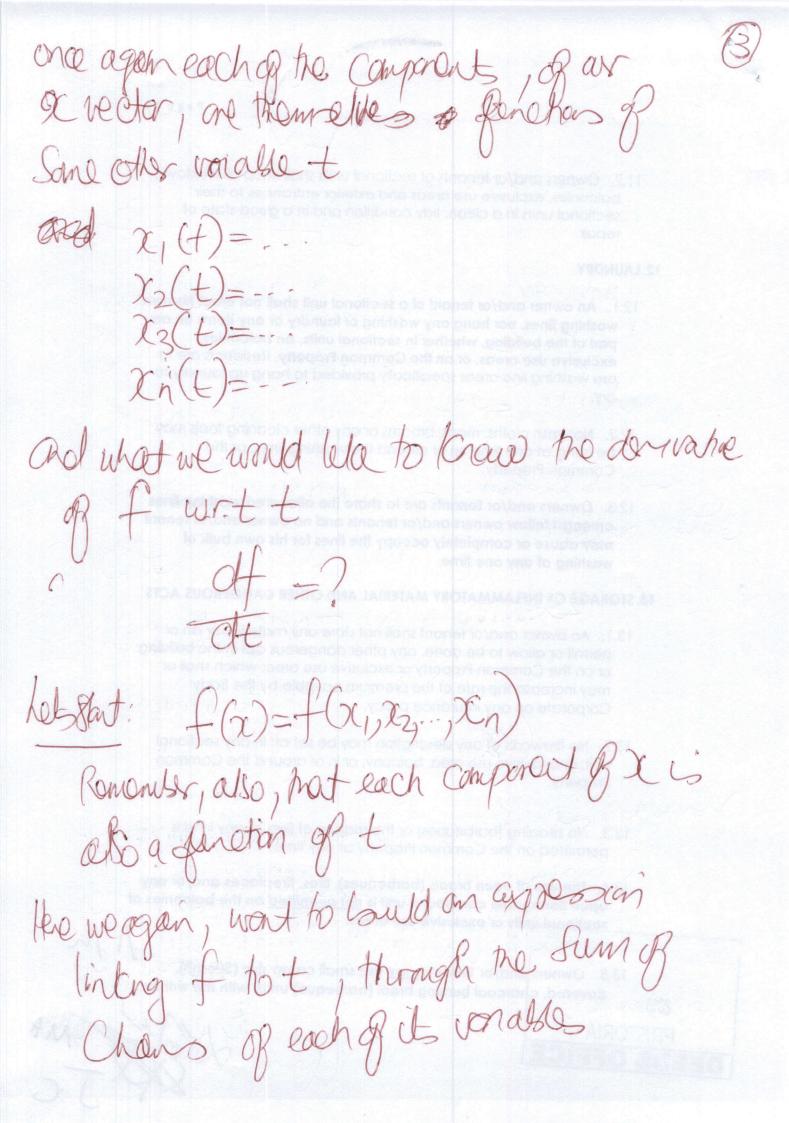
of Ifox If dy + If dz

at Ixat Iy at Iz at

which is simply the sum, of the Chains

relating fort, though each gite 3 words.

The allow of s to calculate he result in (2) a procevise monner of te = cos (t-1)e state han substituting everything et Start; and Computers one really good at solving proceause problems quickly. Whoother going to do now, is generalize his Concept and also simplify he notation a little Eg Hove Denotant gg n vonables, 24.... upto In, f con unleit just as f(x) $f(x_1, x_2, \dots, x_n) = f(x)$ But unten he x in God, to help as remailed nat hier repeats a sequence of vorables, whech will now more Converiently that of as on ndemensional



Of the going to read all the partial derivatives &.

of f write, as well as the derivates

of each of he components of x writ t 0+ dx of Dan in a poir of n demendenal vactors. knally we looking to build a marti vonable Chain rele expression
Bo we botkers to fland the Sum of the product
of each pair of terms in Same position
of each vector.

(5) Thinky back to ax LA, Tusis Gractly wat he dot product does But here is no need for us to unte act has vectors in full, Do we con sumply unto the dot of our two multivorable derivative expressions $\frac{df}{dt} = \frac{4f}{Jx} \cdot \frac{dx}{dt}$ and take it.
We now have our genatelized glam. flor
the muttivenable Chain rule, expressed ruce and nearty. Powe Can naw agadate ar 1848 tross to replication nest Betæll of the other (3) martisonar hme sonner rebs obleddy work for much vonet pollows as togger. w/pod in topractice soon