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MATRIX: MUTIUNDAR MAP: V×V× -> IR alternately: V->V
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[M'i V'] is matrix multiplication
sation awards a 22 li
I is a dummy index RESULING OBJECT HAS ONE VECTOR INDEX
ex. W: M'sV' = #
ed: WHAT IS THE TRACES OF A MATRIX MISS

## TENSOR: GENERAL MUTILINEAR MAP

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THE CONTRACTIONS

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	eg. The Sis what to check!
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	contract indices
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	REMARK: IN THIS WAY, ON VIEW TENSORS AS
	MAPS BETWEEN PRODUCT SPACES
	eg Tis: V&V*&V* -> R
	$V \otimes V^* \rightarrow V$
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	Must @ weave.
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CAN ALSO DEPINE INVERSE METRIC SI	<b>7</b>
WHERE 3'3 3ik = 8'k (= (11)' k	
eg if Sik = (1 1)	

. . . . .



METRIC. MEASURE of DISTANCE	
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Saraph, Sign &	36(8)

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30: tensors are generalised matrices APPEL 455 - UPPER/IDWER INDICES MATTER LV VS. VY UNEAR ( & (2x+By) = 2f(x) ( PSty) - THEY ARE MARS RETWEEN DIFFERENT PRODUCT SPACES ey Tiok takes 2 steethers 1 that to the Nia Tiby V, Wixk ay Tisk takes a (11)-tensor to a vector via Tijk Ski

( \$ 173 INVERSE

- METRIC IS A SPECIAL TENSOR: / IT LETS YOU RAISE/LOWER INDICES & DEPINES THE MEASURE

> 985 = Siggxagx, two tar: do = N go dxi @ dxi gives a way to measure differential

are length... will have to generalize

- symmetry of marces can be important

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· · · · · · · · · · · · · · · · · · ·	they have well defined transformation properties.
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	REMINDER: Fronst of rectors in 122
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	Must sport "anols nector"?
	$(W, W_2) \rightarrow (W, W_2) (sm \theta cos A)$
	RT
	INTUTATION: 2 MAYS
	1. NOTO METRIC TO TURN ROW VECTOR -> OOR VER.  (W, W2) \$ (W,) T  (W2)
And the second s	$\longrightarrow R(w_1)^T + (w_1 w_2)$
	2. USE INVERZANT: FOR AMM (V'z), (W, WZ) (VL) 18 INVARIANT. SINCE (V'z) -> R(V'z), [W, WZ) -> (W, WZ) RT
And the second security of the second	S.t. (W, Wz) (Vz) -> (W, Wz) RTR (Vz)

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