

VECTOR

Dot, Cross, Triple: vector products (1s)	<pre> 6: [1 2 3] 5: [4 5 6] 4: [7 8 1] 3: [-3 6 -3] 2: [1 2 3] 1: [4 5 6] [7 8 1] 24 Vex Dot Cross Trip Outer Dist </pre>	<pre> 6: V:[1 2 3] 5: W:[4 5 6] 4: Outer(V,W) 3: [4 5 6] 2: [8 10 12] 1: [12 15 18] Dist(V,W) 3*sqrt(3) V W Dot Cross Trip Outer </pre>
Outer, Distance: Outer product, distance of points		
Angle, Part: angle, partition (1s)	<pre> 6: Angle(V,W) 5: ACOS(16*sqrt(22)/77) 4: [1 2 3] 3: [4 5 6] 2: [7 8 1] 1: [3 4 5] Dist Angle Part Proj Unit Vangle </pre>	<pre> 6: Proj(V,W) 5: [128/77 160/77 192/77] 4: Unit(V) 3: [1/sqrt(14) 2/sqrt(14) 3/sqrt(14)] 2: Vangle(V) 1: [1.30 1.01 0.64] Dist Angle Part Proj Unit Vangle </pre>
Proj, Unit, Vangle: projection, unit vector, angle with axes (1s)		
Schmidt: ortho-normalisation of $[[1\ 2\ 3][4\ 5\ 6][7\ 8\ 1]]$ (6s)	<pre> 6: [1/sqrt(14) 2/sqrt(14) 3/sqrt(14)] 5: [12/7 27/7 -5/7] 4: [2/sqrt(22) 3/sqrt(22) -4/sqrt(22)] 3: [3/sqrt(33) 2/sqrt(33) 1/sqrt(33)] Schmidt Bcoord BMetric Bunit3 Binv Det </pre>	<pre> 6: [1 2 3] 5: [4 5 6] 4: [7 8 1] 3: [2 1 3] 2: [-73/24 37/12 -8/8] Schmidt Bcoord BMetric Bunit3 Binv Det </pre>
Bcoord: coordinates with respect to basis (1s)		
->Proj: vector v to projector P $P*w$ = projection to v (1s)	<pre> 6: v:[1 2 3] 5: [1 1 3] 4: [14 7 14] 3: [1 2 3] 2: [7 7 7] 1: [3 3 9] [14 7 14] ->Proj ->Spec ->Func aPhi aPhiRM Bcoord </pre>	<pre> 6: A:[1 0 1] 5: [0 1 0] 4: [1 0 1] 3: [1/2 0 -1/2] 2: [1/2 0 1/2] 1: [1/2 0 1/2] ->Proj ->Spec ->Func aPhi aPhiRM Bcoord </pre>
->SpectDec: matrix to spectral decomposition $\{P_k\} \{\lambda_k\}$ (6s)		
->Func: function applied to normal matrix, example squareroot	<pre> 6: A:[1 0 1] 5: [0 1 0] 4: [1 0 1] 3: [1/2 0 -1/2] 2: [1/2 0 1/2] 1: [1/2 0 1/2] ->Proj ->Spec ->Func aPhi aPhiRM Bcoord </pre>	<pre> 6: [0 1 1] 5: [1/2 1/2] 4: [0 -sqrt(2)/2 sqrt(2)/2] 3: [sqrt(2)/2 1/2 1/2] 2: [-sqrt(2)/2 1/2 1/2] 1: [1/2 1/2] ->Proj ->Spec ->Func aPhi aPhiRM Bcoord </pre>
$a\Phi$ ->RM: axis and angle to rotation matrix (5s)		
->EuMetric: euclidean metric 3d cylindrical coordinates	<pre> 6: Ex=r*cos(theta) y=r*sin(theta) z=z 5: [1 0 0] 4: [0 1 0] 3: [0 0 r^2] BMetric Bunit Binv EUEX -EUMD Det </pre>	<pre> 6: [r*sin(theta)*cos(theta) r*sin(theta)*sin(theta) r*cos(theta)] 5: [1 0 0] 4: [0 r^2 0] 3: [0 0 -(r^2*cos(theta)^2-r^2)] BMetric Bunit Binv EUEX -EUMD Det </pre>
3d spherical coordinates (28s)		
Bmetric: basis to metric $g_{ij} = \text{Dot}(b_i, b_j)$	<pre> 6: [1 2 3] 5: [4 5 6] 4: [7 8 1] 3: [14 32 26] 2: [32 77 74] 1: [26 74 114] Schmidt Bcoord BMetric Bunit3 Binv Det </pre>	<pre> 6: [1 2 3] 5: [4 5 6] 4: [7 8 1] 3: [1/sqrt(14) 2/sqrt(14) 3/sqrt(14)] 2: [4/77 5/77 6/77] 1: [7/77 8/77 1/77] Schmidt Bcoord BMetric Bunit3 Binv Det </pre>
Bunit: basis to unit vectors (1s)		
Binv: inverse basis, co-> contravariant vectors(1s)	<pre> 6: [1 2 3] 5: [4 5 6] 4: [7 8 1] 3: [-43/24 13/12 -1/8] 2: [11/12 -5/6 1/4] 1: [-1/8 1/4 1/8] Schmidt Bcoord BMetric Bunit3 Binv Det </pre>	<pre> 6: [1 2 -3] 5: [3.74 1.11 2.50] 4: [1.00 2.00 -3.00] 3: [1 2 -3] 2: [2.24 1.11 -3.00] 1: [1.00 2.00 -3.00] B+SP SP+R B+CY CY+R Bunit3 Bunit3 Bunit3 </pre>
rect., spherical, cyl. coordinates $R \rightarrow SP, SP \rightarrow R, R \rightarrow CY,$ $CY \rightarrow R$: (display 2 FIX) (1s)		

Meval: evaluate vector equations (1s)	<pre> 5: 4: 3: 2: 1: </pre>	<pre> 5: 4: 3: 2: 1: </pre>
Dsqr: $\sqrt{\quad}$ to denominator (2s) RVxCV: row to column vector (1s)	<pre> 5: 4: 3: 2: 1: </pre>	<pre> 5: 4: 3: 2: 1: </pre>
Aijedit: edit element n, {i j} of array in EQW, 3 ->	<pre> 5: 4: 3: 2: 1: </pre>	<pre> 5: 4: 3: 2: 1: </pre>
Nexp: numeric expansion of vector (1s)	<pre> 5: 4: 3: 2: 1: </pre>	<pre> 5: 4: 3: 2: 1: </pre>
HelpVECTOR: help	<pre> 5: 4: 3: 2: 1: </pre>	<pre> 5: 4: 3: 2: 1: </pre>
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