

VECTOR	Vector menu					
g-shift	→DEG	→RAD	→MUL π	$\vec{v}_3[100]$	$\vec{v}_3[010]$	$\vec{v}_3[001]$
f-shift	$\ \vec{x}\ _p$	UNITV	$\ \vec{x}-\vec{y}\ _2$	$\times \vec{x}, \vec{y}$	dot	cross
unshifted	→R	→SPH	→CYL	$zyx \leftrightarrow \vec{v}_3$	$\vec{v} \leftarrow \vec{v}$	DRG
Page 1	F1	F2	F3	F4	F5	F6

Prev menu https://47calc.com/doc/C47/Menus/C47_Menu_VARS_page_1.pdf

Next menu https://47calc.com/doc/C47/Menus/C47_Menu_VECTOR_page_2.pdf

Ref 1 https://47calc.com/doc/C47/Reference/C47_Vector_display.pdf

Level	Label	Type	FullName	Extended description	Category	Flag	Catalog	Default
Menu p1	VECTOR	MENU	Vector menu	Vector functions ; Ref : https://47calc.com/doc/C47/Reference/C47_Vector_display.pdf ; Info : Vectors are stored internally as rectangular and calculation results are presented in rectangular format ; to edit a vector, first put it in rectangular format ; vector TI's are shown for values in X only and a small font may be used ; vector TI's are minimised if the stack changes or [EXIT] is pressed (only ijk or rθk or pθφ is shown, without subscripts or brackets)	Vector operations		VECTOR	
F1	→R	Function (monadic, dyadic)	To rectangular	Transform polar to rectangular coordinates (dyadic, stack conventions according to flag RP _{HP} SET or CLEAR) ; transform Complex number or 2D/3D vector to rectangular notation (monadic) and set RECT tag ; TI : x : Re = ; y : Im = (RECT) ; Info : in Program Entry Mode, flag RP _{HP} determines whether →RECT _{HP} or →RECT _{EX} is stored ; vector display depends on flag 3Dxyz, for 2D rectangular vector : [ij] [v ₁ v ₂] ; 3D rectangular vector : [ijk] [v ₁ v ₂ v ₃]	Complex and coordinates	RP _{HP}	→RECT	
F2	→SPH	Function (monadic)	Tag as Spherical	Tag a 3D vector as having spherical coordinates, according to Physics or Math conventions (for spherical polar vectors) as set by flag 3DPHYS (default CLEAR) and indicated by the TI subscript of the spherical polar vector : p for Physics, m for Math (determines ordering of vector elements, works on whole stack) ; Shortcut : →P cycles through →SPH, then →CYL ; Info : display depends on flag 3DPHYS, for spherical vector : [pθi;φk] _M [v ₁ v ₂ v ₃] ^s	Vector operations	3DPHYS	→SPH	
F3	→CYL	Function (monadic)	Tag as Cylindrical	Tag a 3D vector as having cylindrical coordinates ; Shortcut : →P cycles through →SPH, then →CYL ; Info : display depends on flag 3Dxyz, for cylindrical vector : [rθi;jk] [v ₁ v ₂ v ₃] ^c	Vector operations	3Dxyz	→CYL	
F4	zyx↔v ₃	Function (triadic, nonpgm)	Compose/decompose 1x3 vector	Compose/decompose 1x3 vector from/to Z, Y, X, according to Physics or Math conventions (for spherical polar vectors) as set by flag 3DPHYS (default CLEAR) ; tagged angles in the input will be recognized and the appropriate coordinate tag will be applied to the vector ; Info : Display depends on flag 3Dxyz, for rectangular vector : [ijk] [v ₁ v ₂ v ₃] ; rectangular elements : [i] = ; [j] = ; [k] = ; spherical vector : [pθi;φk] _M [v ₁ v ₂ v ₃] ^s ; spherical elements : [p] = ; [θi] = ; [φk] = ; cylindrical vector : [rθi;jk] [v ₁ v ₂ v ₃] ^c ; cylindrical elements : [r] = ; [θi] = ; [k] =	Vector operations	3Dxyz	zyx↔v ₃	
F5	↔↔↔	MENU	Vector conversions	Vector conversion functions ; Ref : https://47calc.com/doc/C47/Reference/C47_Vector_display.pdf ; Info : Vectors are stored internally as rectangular and calculation results are presented in rectangular format ; to edit a vector, first put it in rectangular format ; vector TI's are shown for values in X only and a small font may be used ; vector TI's are minimised if the stack changes or [EXIT] is pressed (only ijk or rθk or pθφ is shown, without subscripts or brackets)	Vector operations		↔↔↔	
F6	DRG	Function (monadic, cyclic, nonpgm)	Degrees-radians-gradians	Add ADM tag to untagged value in X, convert tagged value to degrees-radians-gradians (cyclic) ; Info : Setting tag for complex X also sets POLAR mode for X according to ADM	Angle conversions		DRG	
fF1	x _p	Function (monadic)	Norm	Norm of vector or matrix in X with parameter p (trailing input) = 0, 1, 2, ..., 9, ∞ : 0 : Number of non-zeros of vector or matrix in X : x ₀ = Σ _i Σ _j I (a _{ij} ≠0), where I is the indicator function, 1 if true, 0 if false ; 1 : Maximum column sum of absolute element values of a matrix in X : x ₁ = max _i Σ _j a _{ij} ; 2 : Euclidean magnitude of a vector in X or Frobenius norm of a matrix in X : x ₂ = √Σ _i Σ _j a _{ij} ² ; 3 : x ₃ = √Σ _i Σ _j a _{ij} ³ ; ... ; 9 : x ₉ = √Σ _i Σ _j a _{ij} ⁹ ; ∞ : Maximum row sum of absolute element values of a matrix in X : x _∞ = max _j Σ _i a _{ij} ; TAM : x _p _ TamNorm menu ; Info : parameter 0, 1, 2, ..., 9, ∞ (use [TamNorm.1] F2 to enter ∞)	Matrix operations		x _p	
fF2	UNITV	Command	Unit vector or matrix	Unit vector or matrix for Real or Complex matrix or vector ; the result will have Euclidean magnitude 1 ; Info : UNITV also applies to Complex numbers	Complex numbers		UNITV	
fF3	x-ȳ ₂	Function (dyadic)	Perpendicular distance	Perpendicular distance between Real matrices or vectors ; Complex matrices or vectors	Vector operations	3Dxyz	x-ȳ ₂	
fF4	↻x,ȳ	Function (dyadic)	Vector angle	Angle between the 2D or 3D vectors in X and Y	Matrix operations	3Dxyz	↻x,ȳ	

Level	Label	Type	FullName	Extended description	Category	Flag	Catalog	Default
fF5	dot	Function (dyadic)	Dot product (·)	Dot product of vectors in X and Y	Complex numbers		DOT	
fF6	cross	Function (dyadic)	Cross product (×)	Cross product of vectors in X and Y	Complex numbers		CROSS	
gF1	→DEG	Function (monadic)	Set DEG tag or convert to DEG	If untagged, set tag to DEG (degrees) ; if tagged, convert X to DEG ; does not change Angular Display Mode ; Tag : °	Angle tagging or conversion		→DEG	
gF2	→RAD	Function (monadic)	Set RAD tag or convert to RAD	If untagged, set tag to RAD (radians) ; if tagged, convert X to RAD ; does not change Angular Display Mode ; Tag : °	Angle tagging or conversion		→RAD	
gF3	→MULπ	Function (monadic)	Set MULπ tag or convert to MULπ	If untagged, set tag to MULπ (multiple of pi radians) ; if tagged, convert X to MULπ ; does not change Angular Display Mode ; Tag : π	Angle tagging or conversion		→MULπ	
gF4	$\vec{v}_3[100]$	Command	Unit vector $[1 \ 0 \ 0]$	Create a new 3D unit vector with elements $[1 \ 0 \ 0]$; Info : Display depends on flag 3Dxyz, for rectangular vector : $[ijk] \ [v_1 \ v_2 \ v_3]$	Vector operations	3Dxyz	$\vec{v}_3[100]$	
gF5	$\vec{v}_3[010]$	Command	Unit vector $[0 \ 1 \ 0]$	Create a new 3D unit vector with elements $[0 \ 1 \ 0]$; Info : Display depends on flag 3Dxyz, for rectangular vector : $[ijk] \ [v_1 \ v_2 \ v_3]$	Vector operations	3Dxyz	$\vec{v}_3[010]$	
gF6	$\vec{v}_3[001]$	Command	Unit vector $[0 \ 0 \ 1]$	Create a new 3D unit vector with elements $[0 \ 0 \ 1]$; Info : Display depends on flag 3Dxyz, for rectangular vector : $[ijk] \ [v_1 \ v_2 \ v_3]$	Vector operations	3Dxyz	$\vec{v}_3[001]$	

p1	VECTOR	Link
F1	$\rightarrow R$	
F2	$\rightarrow SPH$	
F3	$\rightarrow CYL$	
F4	$zyx \leftrightarrow \vec{v}_3$	
F5	$\vec{v} \leftrightarrow \vec{v}$	https://47calc.com/doc/C47/Menus/C47_Menu_VectorConv_page_1.pdf
F6	DRG	
fF1	$\ x\ _p$	
fF2	UNITV	
fF3	$\ \vec{x} - \vec{y}\ _2$	
fF4	$\angle \vec{x}, \vec{y}$	
fF5	dot	
fF6	cross	
gF1	$\rightarrow DEG$	
gF2	$\rightarrow RAD$	
gF3	$\rightarrow MUL\pi$	
gF4	$\vec{v}_3[100]$	
gF5	$\vec{v}_3[010]$	
gF6	$\vec{v}_3[001]$	