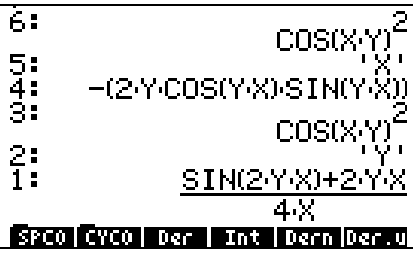
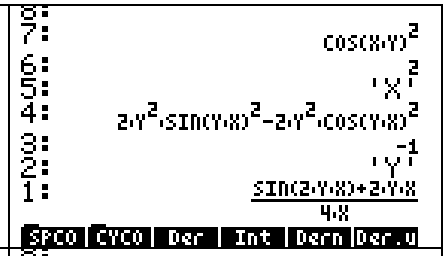
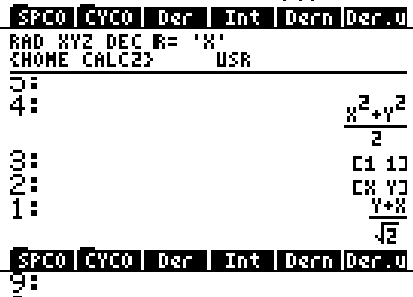
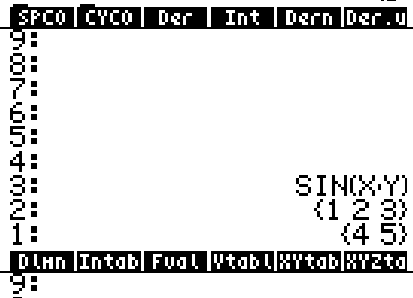
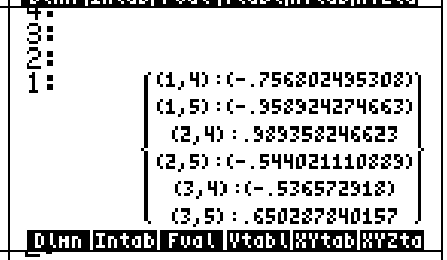
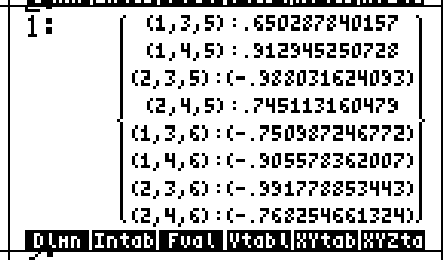
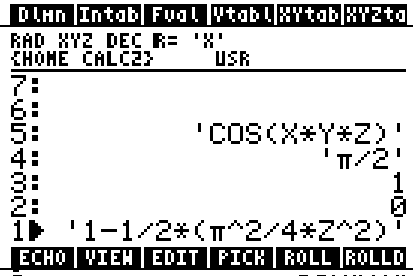
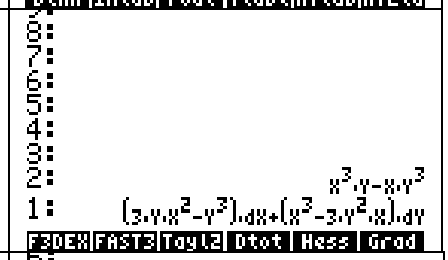
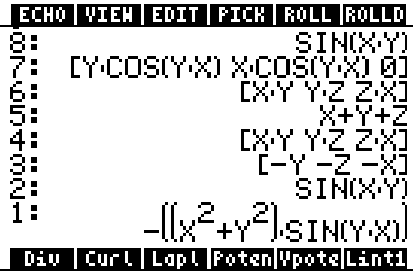
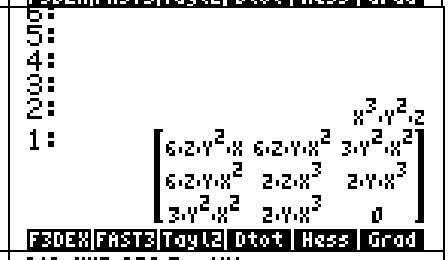
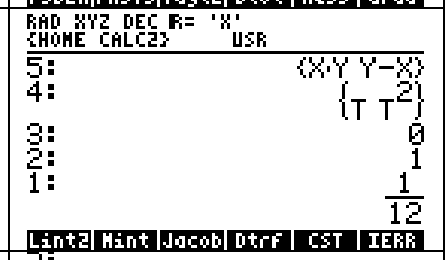
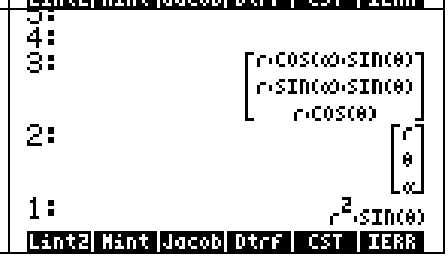
CALC2

Der: derivative (0.6s) Int: integral (3s) Dern: n.th (anti-) derivative (1.5s, 3,2s)		
Der.u: directional derivative (0.5s) Fval: function value (0.5s)		
XYtable: table of values (2s) result (2s)		
XYZtable: table of values (2s) result		
Tayl2: Taylor series around X0 Y0 Z0 up to n=2 (7s) Dtot: total derivative		
Grad, Div, Curl, Lapl: of scalar or vector (0.5s) Hess: Hessian (s)		
Lint1: line integral 1. kind $\int f(X(T),Y(T))\sqrt{(X'^2+Y'^2)}dT$ (9s) Lint2: line integral 2. kind $\int(f_X dX+f_Y dY)$ (3s)		
Jacobian: of cylindrical coordinates (0.8s) Jacobian of spherical coordinates (4,2s)		

SPCO: →rΘα: cartesian to spherical coordinates (1s) S→XYZ: spherical to cartesian coordinates (2.6s)	RAD XYZ DEC ℝ= 'X' \OME CALC2 SPCO} USR 6: 5: 4: $\frac{Y}{X}$ 3: TAN(α) 2: '2' 1: r·COS(θ) →rθα S→XYZ Derr Derθ Derα Intr	RAD XYZ DEC ℝ= 'X' \OME CALC2 SPCO} USR 6: 5: 4: 3: 2: r·θ 1: $\sqrt{X^2+Y^2+Z^2}\cdot ATAN\left(\frac{\sqrt{X^2+Y^2}}{Z}\right)$ →rθα S→XYZ Derr Derθ Derα Intr
SPCO: Sgrad,div,curl: grad, div, curl in spherical coordinates (1s) Slapl: Laplacian in spherical coordinates (0.4s)	8: 7: 6: r·COS(θ) 5: [-SIN(θ) 0 COS(θ)] 4: [r θ α] 3: $\frac{(3\cdot r+1)\cdot SIN(\theta)+\theta\cdot COS(\theta)+1}{r\cdot SIN(\theta)}$ 2: [r θ α] 1: $\left[\frac{\alpha COS(\theta)}{r\cdot SIN(\theta)}\ -\frac{\alpha}{r}\ \frac{\theta}{r}\right]$ Intθ Intα Sgrad Sdiv Scurl Slapl	RAD XYZ DEC ℝ= 'X' \OME CALC2 SPCO} USR 5: 4: 3: 2: 'θ' 1: $\frac{1}{r^2\cdot TAN(\theta)}$ Intθ Intα Sgrad Sdiv Scurl Slapl
CYCO: →ραz: cartesian to cylindrical coordinates (0.7s) C→XYZ: cylindrical to cartesian coordinates (1s)	RAD XYZ DEC ℝ= 'X' \OME CALC2 CYCO} USR 4: $(X^2+Y^2)\cdot Z$ 3: $\rho^2\cdot Z$ 2: $\frac{Y}{X}\cdot Z$ 1: z·TAN(α) →ραz C→XYZ Derρ Derα Derz Intρ	6: 5: 4: {ρ α} 3: $\left\{\sqrt{X^2+Y^2}\ \ ATAN\left(\frac{Y}{X}\right)\right\}$ 2: $\rho^2\cdot SIN(\alpha)$ 1: $Y\cdot\sqrt{X^2+Y^2}$ →ραz C→XYZ Derρ Derα Derz Intρ
CYCO: Cgrad,div,curl: grad, div, curl in cyl. coordinates (1s) Clapl: Laplacian in cyl. coordinates (0.4s)	7: 6: ρ·α·z 5: [α·z z ρ·α] 4: [ρ α z] 3: $\frac{\rho+2}{\rho}$ 2: [ρ α z] 1: $\left[0\ 0\ \frac{\alpha}{\rho}\right]$ Intα Intz Cgrad Cdiv Ccurl Clapl	8: 7: 6: 5: 4: $\rho^2\cdot\alpha\cdot z$ 3: 4·α·z 2: [ρ α z] 1: $\left[\frac{1}{\rho}\ 0\ 0\right]$ Intα Intz Cgrad Cdiv Ccurl Clapl
HelpCALC2: help	CALC2: CALCULUS FOR FUNCTIONS OF VARIABLES X,Y,Z SPCO: SPHER. COORD. θ α r CYCO: CYL. COORD. ρ α z Der F V → ∂V(F) DERIV.EXPAND Int F V → ∫FdV INT.,EXPAND Dern F n V → ∂nV(F) (n>0) → ∫nFdV (n<0) n times (anti)derivative Der.u F u [V] → ∂V(F).u directional derivative GRAPH OK	Dlnn F l A n → DIRDAYDn2(F) l,A,n >,< 0 Intab F a b V → ∫(a,b,F,V) Fval F(X,Y,Z) {X0 Y0 Z0} → F0 Vtable F {A1..AN}(a b s) V → {} TABLE OF FCT.VALUES OF {A1..} OR a TO b STEP s V = X,Y,Z VARIABLE XYtable F(X,Y) {X1..XN} {Y1..YN} → {Fi,j} XYZtable F(X,Y,Z) {X1..XN} {Y1..YN} {Z1..ZN}→{Fi,j} GRAPH OK
HelpCALC2: help	F3DEX example fast 3D plot FAST3DP '..' → '..' plot Tayl2 F X0 Y0 Z0 → ε TAYLORSER. Dtot F→∂X(F)dX+∂Y(F)dY+∂Z(F)dZ Grad F(X,Y,Z) → grad(F) Div [F] → DIV(F) Curl [F] → CURL(F) Lapl F → Δ(F) LAPLACIAN Potential [F] → POTENTIAL exists if DIV[F]=0 Vpotential [F] → G VECTOR POT. exists if CURL[F]=0 GRAPH OK	exists if CURL[F]=0 Lint1 F {X(T)..} T1 T2 → I LINEINTEGRAL 1.KIND Lint2 F {c(T)} T1 T2 → I LINEINTEGRAL 2.KIND Mint F {a1 b1..} {X1..Xn} → I MULTIPLE INTEGRALS Jacobian {X1(R,j)..Xn(R,j)}{R1..Rk} → J JACOBIDETERMINANT Dtrf F(∂Rk(U)) {X1=X1(Rk)..} {R1=R1(Rk)..} → G(∂Rk(U)) DIFF.TRANSFORMATIONS GRAPH OK