```
> restart
> A := 7/9
```

$$A := \frac{7}{9} \quad (1)$$

```
> B := sqrt(2)
```

$$B := \sqrt{2} \quad (2)$$

```
> evalf(A)
```

$$0.7777777778 \quad (3)$$

```
> evalf(B)
```

$$1.414213562 \quad (4)$$

```
> C := 1/10000000000000000000000000000000
```

$$C := \frac{1}{10000000000000000000000000000000} \quad (5)$$

```
> evalf(C)
```

$$1.000000000\ 10^{-31} \quad (6)$$

```
> restart
> DiaSemana := Lunes, Martes, Miercoles, Jueves, Viernes, Sabado, Domingo
```

$$DiaSemana := Lunes, Martes, Miercoles, Jueves, Viernes, Sabado, Domingo \quad (7)$$

```
> DiaSemana[3]
```

$$Miercoles \quad (8)$$

```
> DiaSemana[6]
```

$$Sabado \quad (9)$$

```
> Dia := [DiaSemana]
```

$$Dia := [Lunes, Martes, Miercoles, Jueves, Viernes, Sabado, Domingo] \quad (10)$$

```
> DiaHabil := Dia[1..5]
```

$$DiaHabil := [Lunes, Martes, Miercoles, Jueves, Viernes] \quad (11)$$

```
> DiaFinSemana := Dia[6..7]
```

$$DiaFinSemana := [Sabado, Domingo] \quad (12)$$

```
> DiaConjunto := {DiaSemana}
```

$$DiaConjunto := \{Domingo, Jueves, Lunes, Martes, Sabado, Viernes, Miercoles\} \quad (13)$$

```
> DiaOrdenado := sort(Dia)
```

$$DiaOrdenado := [Domingo, Jueves, Lunes, Martes, Miercoles, Sabado, Viernes] \quad (14)$$

```
> Ecuacion := 2·y(x)·(y'(x) + 2) − x·(y'(x))··2 = 0
```

$$Ecuacion := 2\,y(x)\left(\frac{d}{dx}y(x) + 2\right) - x\left(\frac{d}{dx}y(x)\right)^2 = 0 \quad (15)$$

```
> Solucion := dsolve(Ecuacion)
```

$$Solucion := y(x) = 0, y(x) = -4x, y(x) = \frac{1}{2}\,\frac{x\,(-x + 2\,\_C1)^2}{\_C1^2\left(-\frac{-x + 2\,\_C1}{\_C1} + 2\right)} \quad (16)$$

```
> Solucion[1]; Solucion[2]; Solucion[3]
```

$$y(x) = 0$$

$$y(x) = -4\,x$$

$$y(x) = \frac{1}{2}\,\frac{x\,(-x+2\,\_C1)^2}{\_C1^2\left(-\frac{-x+2\,\_C1}{\_C1}+2\right)} \quad \textbf{(17)}$$

> $Ecua := x\cdot\cdot 2 + x + 1 = 0$

$$Ecua := x^2 + x + 1 = 0 \quad \textbf{(18)}$$

> $Raiz := solve(Ecua)$

$$Raiz := -\frac{1}{2} + \frac{1}{2}\,I\sqrt{3},\ -\frac{1}{2} - \frac{1}{2}\,I\sqrt{3} \quad \textbf{(19)}$$

> $Raiz_1; Raiz_2$

$$-\frac{1}{2} + \frac{1}{2}\,I\sqrt{3}$$

$$-\frac{1}{2} - \frac{1}{2}\,I\sqrt{3} \quad \textbf{(20)}$$

> $Sistema := 2\cdot x + 3\cdot y = 5,\ x + 4\cdot y = -7$

$$Sistema := 2\,x + 3\,y = 5,\ x + 4\,y = -7 \quad \textbf{(21)}$$

> $Sistema_1; Sistema_2$

$$2\,x + 3\,y = 5$$

$$x + 4\,y = -7 \quad \textbf{(22)}$$

> $Solucion := solve(\{Sistema\},\ \{x, y\})$

$$Solucion := \left\{x = \frac{41}{5},\ y = -\frac{19}{5}\right\} \quad \textbf{(23)}$$

> $EcuacionDiferencial := y''(x) - 6\cdot y'(x) + 8\cdot y(x) = 2\cdot\exp(2\cdot x)$

$$EcuacionDiferencial := \frac{d^2}{dx^2}\,y(x) - 6\left(\frac{d}{dx}\,y(x)\right) + 8\,y(x) = 2\,e^{2x} \quad \textbf{(24)}$$

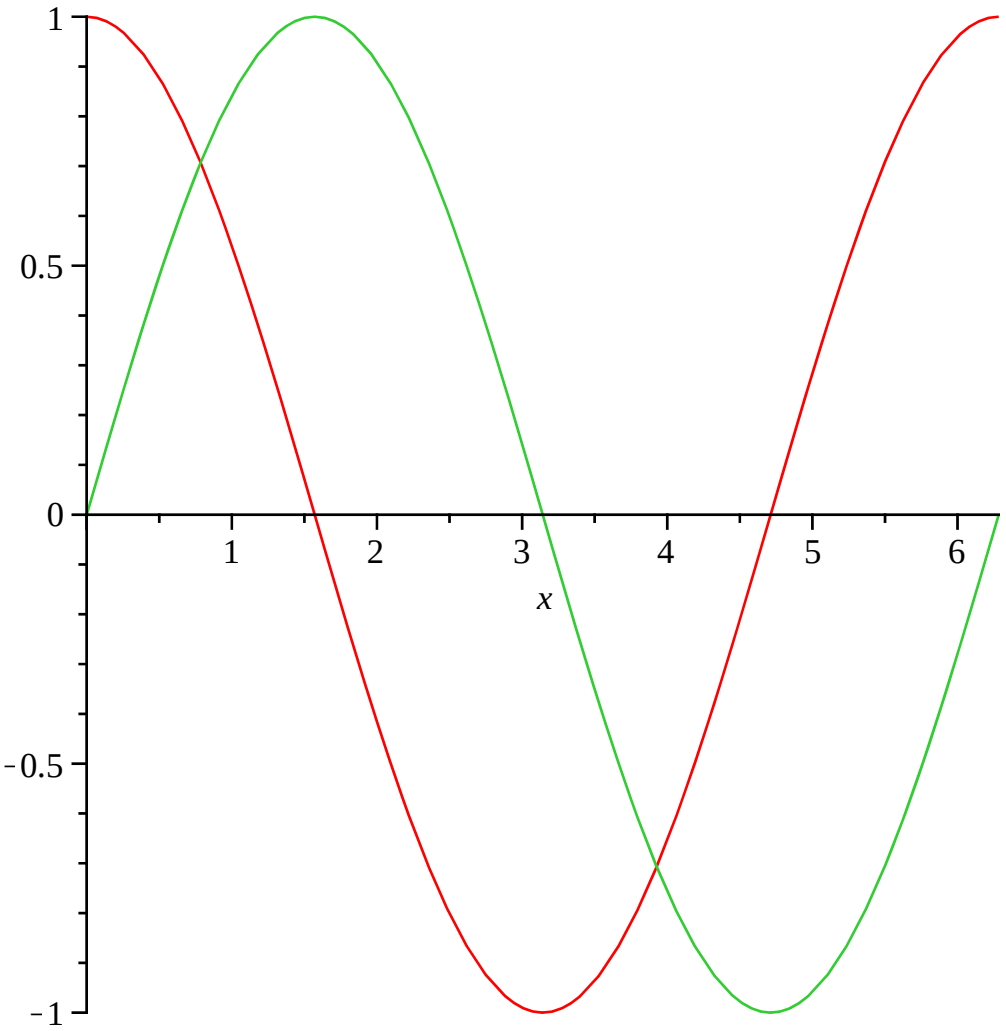
> $CondicionesIniciales := y(0) = 4,\ D(y)(0) = -2$

$$CondicionesIniciales := y(0) = 4,\ D(y)(0) = -2 \quad \textbf{(25)}$$

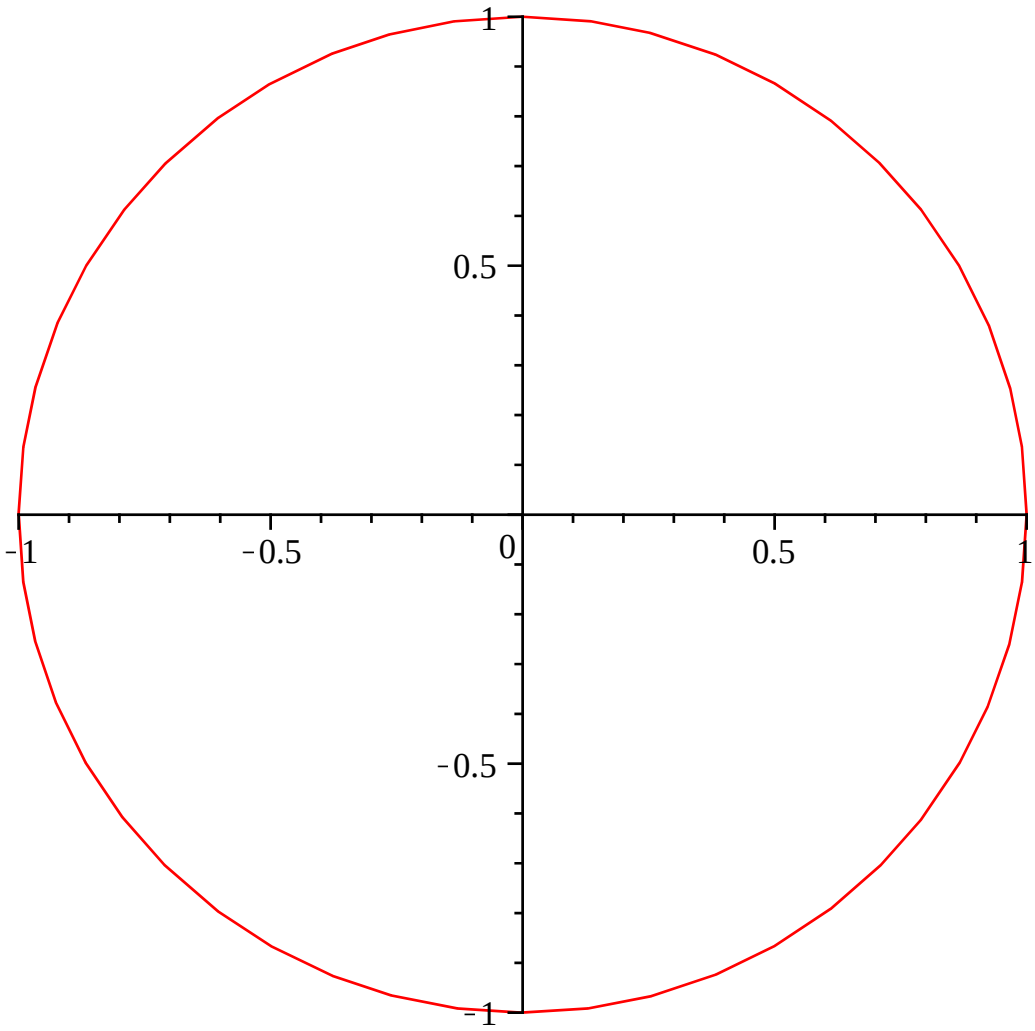
> $SolParticular := dsolve(\{EcuacionDiferencial, CondicionesIniciales\},\ \{y(x)\})$

$$SolParticular := y(x) = \left(-x - \frac{9}{2}\,e^{2x} + \frac{17}{2}\right)e^{2x} \quad \textbf{(26)}$$

> $plot([\cos(x), \sin(x)], x = 0..2\cdot Pi)$




```
> plot( [cos(t), sin(t), t = 0 ..2 Pi ])
```



> $AAA := array([[1, 2, 3], [4, -5, 6], [7, 8, 9]])$

$$AAA := \begin{bmatrix} 1 & 2 & 3 \\ 4 & -5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \quad (27)$$

> $with(linalg);$

$[BlockDiagonal, GramSchmidt, JordanBlock, LUdecomp, QRdecomp, Wronskian, addcol,$ **(28)**
addrow, adj, adjoint, angle, augment, backsub, band, basis, bezout, blockmatrix, charmat, charpoly, cholesky, col, coldim, colspace, colspan, companion, concat, cond, copyinto, crossprod, curl, definite, delcols, delrows, det, diag, diverge, dotprod, eigenvals, eigenvalues, eigenvectors, eigenvects, entermatrix, equal, exponential, extend, ffgausselim, fibonacci, forwardsub, frobenius, gausselim, gaussjord, geneqns, genmatrix, grad, hadamard, hermite, hessian, hilbert, htranspose, ihermite, indexfunc, innerprod, intbasis, inverse, ismith, issimilar, iszero, jacobian, jordan, kernel, laplacian, leastsqrs, linsolve, matadd, matrix, minor, minpoly, mulcol, mulrow, multiply, norm, normalize, nullspace, orthog, permanent, pivot, potential, randmatrix, randvector, rank, ratform, row, rowdim, rowspace, rowspan, rref, scalarmul, singularvals, smith, stackmatrix, submatrix, subvector, sumbasis, swapcol, swaprow, sylvester, toeplitz, trace, transpose, vandermonde, vecpotent,

vectdim, vector, wronskian]

> *Determinante* := *det*(*AAA*)

$$Determinante := 120 \tag{29}$$

> *MatrizInversa* := *inverse*(*AAA*)

$$MatrizInversa := \begin{bmatrix} -\frac{31}{40} & \frac{1}{20} & \frac{9}{40} \\ \frac{1}{20} & -\frac{1}{10} & \frac{1}{20} \\ \frac{67}{120} & \frac{1}{20} & -\frac{13}{120} \end{bmatrix} \tag{30}$$

> *Identidad* := *evalm*(*AAA* &* *MatrizInversa*)

$$Identidad := \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \tag{31}$$

> *with*(*DEtools*)

[*AreSimilar, DEnormal, DEplot, DEplot3d, DEplot_polygon, DFactor, DFactorLCLM, DFactorsols, Dchangevar, FunctionDecomposition, GCRD, Gosper, Heunsols, Homomorphisms, IVPsol, IsHyperexponential, LCLM, MeijerGsols, MultiplicativeDecomposition, ODEInvariants, PDEchangecoords, PolynomialNormalForm, RationalCanonicalForm, ReduceHyperexp, RiemannPsols, Xchange, Xcommutator, Xgauge, Zeilberger, abelsol, adjoint, autonomous, bernoullisol, buildsol, buildsym, canoni, caseplot, casesplit, checkrank, chinisol, clairautsol, constcoeffsols, convertAlg, convertsys, dalembertsol, dcoeffs, de2diffop, dfieldplot, diff_table, diffop2de, dperiodic_sols, dpolyform, dsubs, eigenring, endomorphism_charpoly, equinv, eta_k, eulersols, exactsol, expsols, exterior_power, firint, firtest, formal_sol, gen_exp, generate_ic, genhomosol, gensys, hamilton_eqs, hypergeomsols, hyperode, indicialeq, infgen, initialdata, integrate_sols, intfactor, invariants, kovacicsols, leftdivision, liesol, line_int, linearsol, matrixDE, matrix_riccati, maxdimsystems, moser_reduce, muchange, mult, mutest, newton_polygon, normalG2, ode_int_y, ode_y1, odeadvisor, odepde, parametricsol, particularsol, phaseportrait, poincare, polysols, power_equivalent, rational_equivalent, ratsols, redode, reduceOrder, reduce_order, regular_parts, regularsp, remove_RootOf, riccati_system, riccatisol, rifread, rifsimp, rightdivision, rtaylor, separablesol, singularities, solve_group, super_reduce, symgen, symmetric_power, symmetric_product, symtest, transinv, translate, untranslate, varparam, zoom*] **(32)**

> *with*(*PDEtools*)

[*CanonicalCoordinates, ChangeSymmetry, CharacteristicQ, CharacteristicQInvariants, ConservedCurrentTest, ConservedCurrents, ConsistencyTest, D_Dx, DeterminingPDE, Eta_k, Euler, FromJet, InfinitesimalGenerator, Infinitesimals, IntegratingFactorTest, IntegratingFactors, InvariantSolutions, InvariantTransformation, Invariants, Laplace, Library, PDEplot, PolynomialSolutions, ReducedForm, SimilaritySolutions, SimilarityTransformation, SymmetrySolutions, SymmetryTest, SymmetryTransformation,* **(33)**

TWSolutions, ToJet, build, casesplit, charstrip, dchange, dcoeffs, declare, diff_table, difforder, dpolyform, dsubs, mapde, separability, splitstrip, splitsys, undeclare]

```
> with(inttrans)
```

[*addtable, fourier, fouriercos, fouriersin, hankel, hilbert, invfourier, invhilbert, invlaplace, invmellin, laplace, mellin, savetable*] **(34)**

```
> with(plots)
```

[*animate, animate3d, animatecurve, arrow, changecoords, complexplot, complexplot3d, conformal, conformal3d, contourplot, contourplot3d, coordplot, coordplot3d, densityplot, display, dualaxisplot, fieldplot, fieldplot3d, gradplot, gradplot3d, graphplot3d, implicitplot, implicitplot3d, inequal, interactive, interactiveparams, intersectplot, listcontplot, listcontplot3d, listdensityplot, listplot, listplot3d, loglogplot, logplot, matrixplot, multiple, odeplot, pareto, plotcompare, pointplot, pointplot3d, polarplot, polygonplot, polygonplot3d, polyhedra_supported, polyhedraplot, rootlocus, semilogplot, setcolors, setoptions, setoptions3d, spacecurve, sparsematrixplot, surfdata, textplot, textplot3d, tubeplot*] **(35)**

```
> WW := wronskian([x··2·exp(x), x·exp(x), exp(x)], x)
```

$$WW := \begin{bmatrix} x^2 e^x & x e^x & e^x \\ 2 x e^x + x^2 e^x & e^x + x e^x & e^x \\ 2 e^x + 4 x e^x + x^2 e^x & 2 e^x + x e^x & e^x \end{bmatrix} \quad \textbf{(36)}$$

```
> DetWW := det(WW) ≠ 0
```

$$DetWW := -2 \left(e^x\right)^3 \neq 0 \quad \textbf{(37)}$$

```
> CCC := array([[2, 3], [1, 4]])
```

$$CCC := \begin{bmatrix} 2 & 3 \\ 1 & 4 \end{bmatrix} \quad \textbf{(38)}$$

```
> BB := array([5, -7])
```

$$BB := \begin{bmatrix} 5 & -7 \end{bmatrix} \quad \textbf{(39)}$$

```
> SOL := linsolve(CCC, BB)
```

$$SOL := \begin{bmatrix} \frac{41}{5} & -\frac{19}{5} \end{bmatrix} \quad \textbf{(40)}$$

```
>
>
>
>
```