```
> restart
> EcuaUno := x··2 − 5·x + 6 = 0
```

$$EcuaUno := x^2 - 5\,x + 6 = 0 \quad (1)$$

```
> Raiz := solve(EcuaUno)
```

$$Raiz := 3, 2 \quad (2)$$

```
> Raiz[1]
```

$$3 \quad (3)$$

```
> Raiz[2]
```

$$2 \quad (4)$$

```
> EcuaOriginal := expand((x − Raiz[1])·(x − Raiz[2])) = 0
```

$$EcuaOriginal := x^2 - 5\,x + 6 = 0 \quad (5)$$

```
> EcUno := x + 2·y + 3·z = 2
```

$$EcUno := x + 2\,y + 3\,z = 2 \quad (6)$$

```
> EcDos := 4·x − 5·y + 6·z = 4
```

$$EcDos := 4\,x - 5\,y + 6\,z = 4 \quad (7)$$

```
> EcTres := 7·x + 8·y + 9·z = 7
```

$$EcTres := 7\,x + 8\,y + 9\,z = 7 \quad (8)$$

```
> SolucionSistema := solve({EcUno, EcDos, EcTres}, {x, y, z})
```

$$SolucionSistema := \left\{x = \frac{9}{40}, y = \frac{1}{20}, z = \frac{67}{120}\right\} \quad (9)$$

```
> evalf(%, 3)
```

$$\{x = 0.225, y = 0.0500, z = 0.558\} \quad (10)$$

```
> EcuaDif := diff(y(t), t$2) = 100·y(t)
```

$$EcuaDif := \frac{d^2}{dt^2} y(t) = 100\,y(t) \quad (11)$$

```
> CondicionesIniciales := y(0) = 10, D(y)(0) = 20
```

$$CondicionesIniciales := y(0) = 10, D(y)(0) = 20 \quad (12)$$

```
> SolucionGeneral := dsolve(EcuaDif)
```

$$SolucionGeneral := y(t) = \_C1\,e^{10\,t} + \_C2\,e^{-10\,t} \quad (13)$$

```
> SolucionPart := dsolve({EcuaDif, CondicionesIniciales})
```

$$SolucionPart := y(t) = 6\,e^{10\,t} + 4\,e^{-10\,t} \quad (14)$$

```
> PrimeraCondicion := simplify(subs(t = 0, SolucionPart))
```

$$PrimeraCondicion := y(0) = 10 \quad (15)$$

```
> SegundaCondicion := simplify(subs(t = 0, diff(SolucionPart, t)))
```

$$SegundaCondicion := diff(y(0), 0) = 20 \quad (16)$$

```
> Comprobacion := simplify(expand(subs(y(t) = rhs(SolucionPart), lhs(EcuaDif)
      − rhs(EcuaDif) = 0)))
```

$$Comprobacion := 0 = 0 \quad (17)$$

```
> ComprobacionGral := simplify(expand(subs(y(t) = rhs(SolucionGeneral), lhs(EcuaDif)
      − rhs(EcuaDif) = 0)))
```

$$ComprobacionGral := 0 = 0 \quad (18)$$

```
> restart
> with(linalg) :
```

```
> AA := Matrix([[1, 2, 3], [4, -5, 6], [7, 8, 9]])
```

$$AA := \begin{bmatrix} 1 & 2 & 3 \\ 4 & -5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \quad (19)$$

```
> Valor := det(AA)
```

$$Valor := 120 \quad (20)$$

```
> AAinversa := inverse(AA)
```

$$AAinversa := \begin{bmatrix} -\frac{31}{40} & \frac{1}{20} & \frac{9}{40} \\ \frac{1}{20} & -\frac{1}{10} & \frac{1}{20} \\ \frac{67}{120} & \frac{1}{20} & -\frac{13}{120} \end{bmatrix} \quad (21)$$

```
> Identidad := evalm(AA &* AAinversa)
```

$$Identidad := \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \quad (22)$$

```
> AA
```

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & -5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \quad (23)$$

```
> BB := Matrix([[5, 8, 9], [2, 4, 5]])
```

$$BB := \begin{bmatrix} 5 & 8 & 9 \\ 2 & 4 & 5 \end{bmatrix} \quad (24)$$

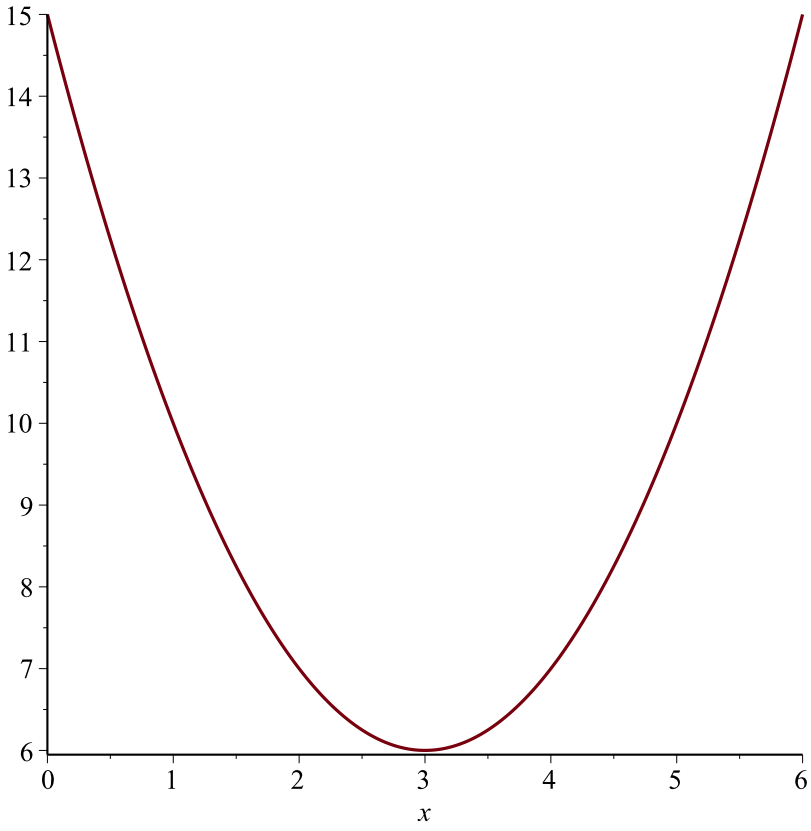
```
> ProdMatr := evalm(BB &* AA)
```

$$ProdMatr := \begin{bmatrix} 100 & 42 & 144 \\ 53 & 24 & 75 \end{bmatrix} \quad (25)$$

```
> restart
> Ecuacion := x··2 - 6·x + 15 = 0
```

$$Ecuacion := x^2 - 6\,x + 15 = 0 \quad (26)$$

```
> plot(lhs(Ecuacion), x = 0..6)
```



> $Raiz := solve(Ecuacion)$

$$Raiz := 3 + I\sqrt{6}, 3 - I\sqrt{6} \quad (27)$$

> $evalf(\%, 3)$

$$3. + 2.45\,I, 3. - 2.45\,I \quad (28)$$

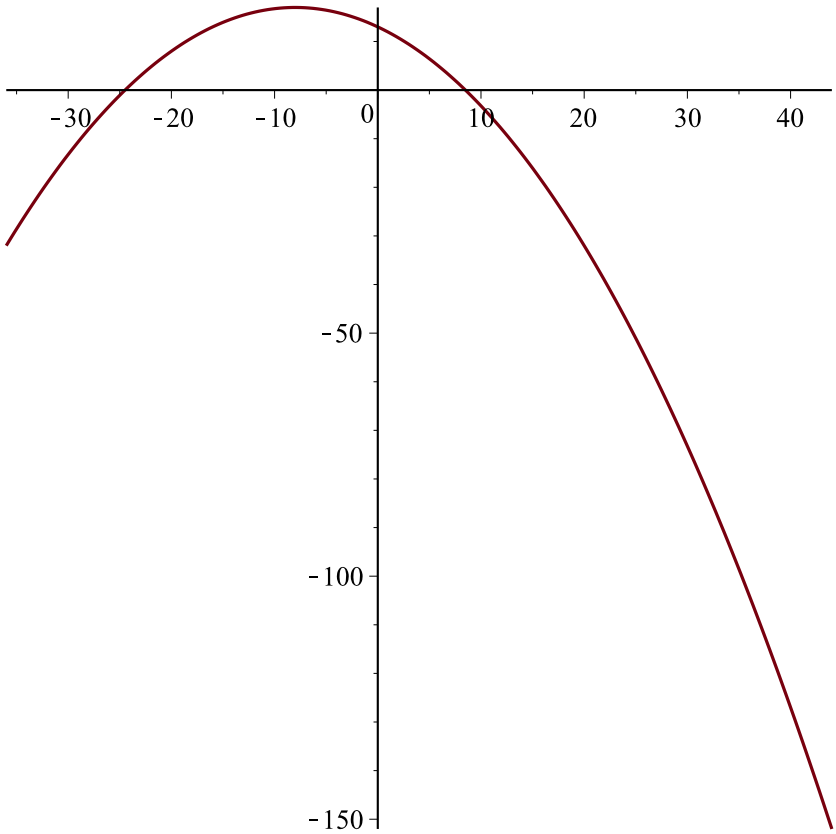
> $FuncionUno := y(t) = -t\cdot\cdot 2 - 6\cdot t + 8$

$$FuncionUno := y(t) = -t^2 - 6\,t + 8 \quad (29)$$

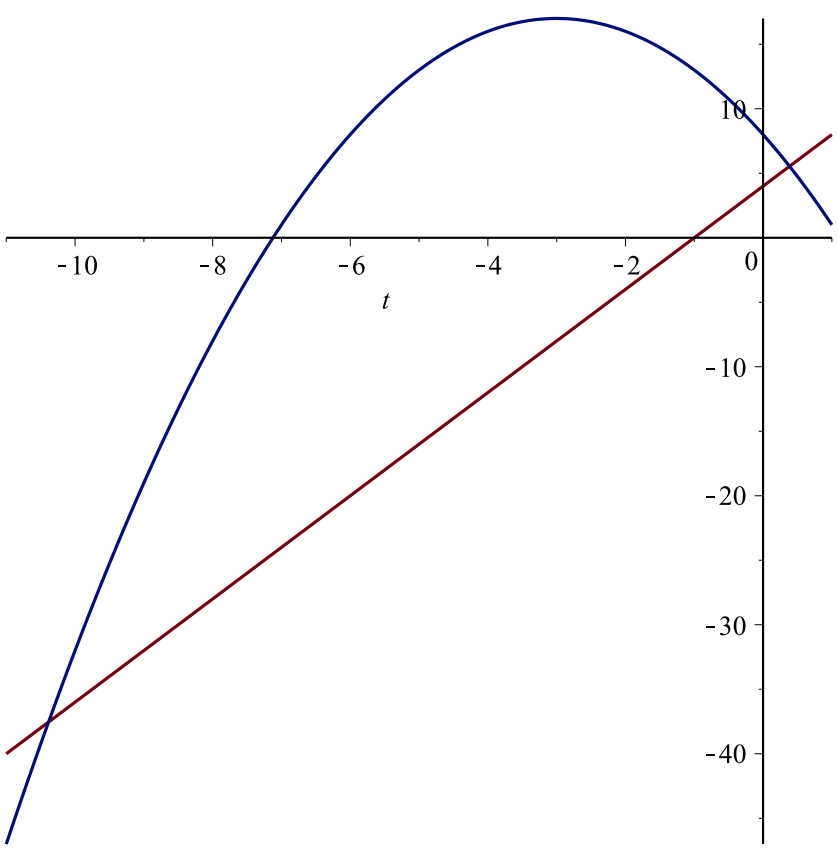
> $FuncionDos := x(t) = 4\cdot t + 4$

$$FuncionDos := x(t) = 4\,t + 4 \quad (30)$$

> $plot([rhs(FuncionDos), rhs(FuncionUno), t = -10..10])$



> $plot([rhs(FuncionDos), rhs(FuncionUno)], t = -11..1)$



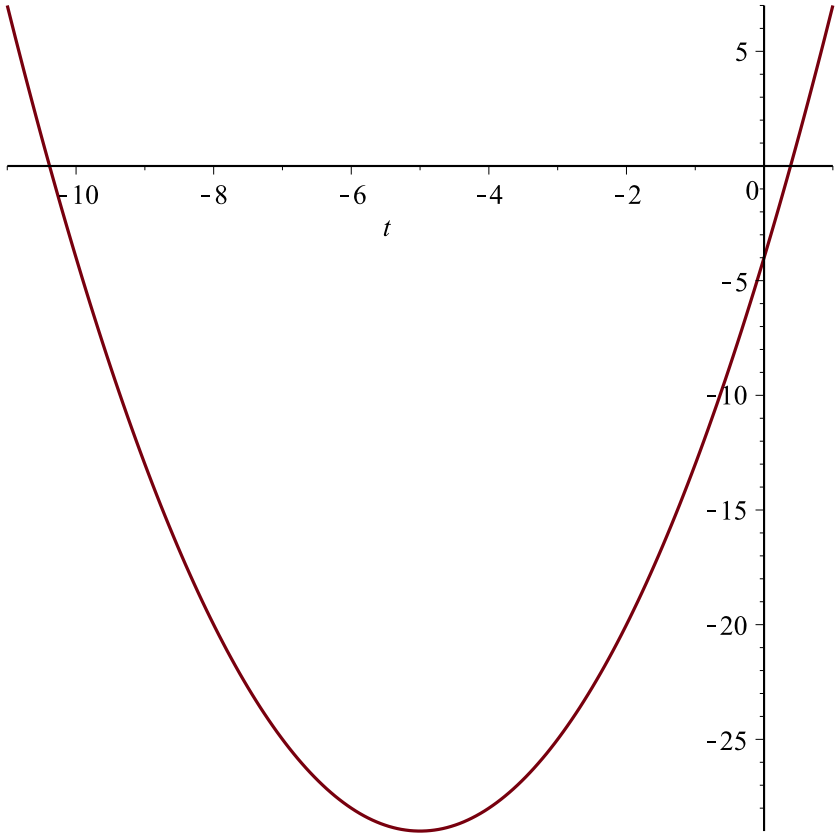
> $solve(rhs(FuncionDos) = rhs(FuncionUno))$

$$-5+\sqrt{29},\ -5-\sqrt{29} \tag{31}$$

> $evalf(\%, 4)$

$$0.385,\ -10.38 \tag{32}$$

> $plot(rhs(FuncionDos) - rhs(FuncionUno), t = -11..1)$




```
>
>
> Intervalo := theta = -Pi..Pi
```

$$Intervalo := \theta = -\pi..\pi \quad \textbf{(33)}$$

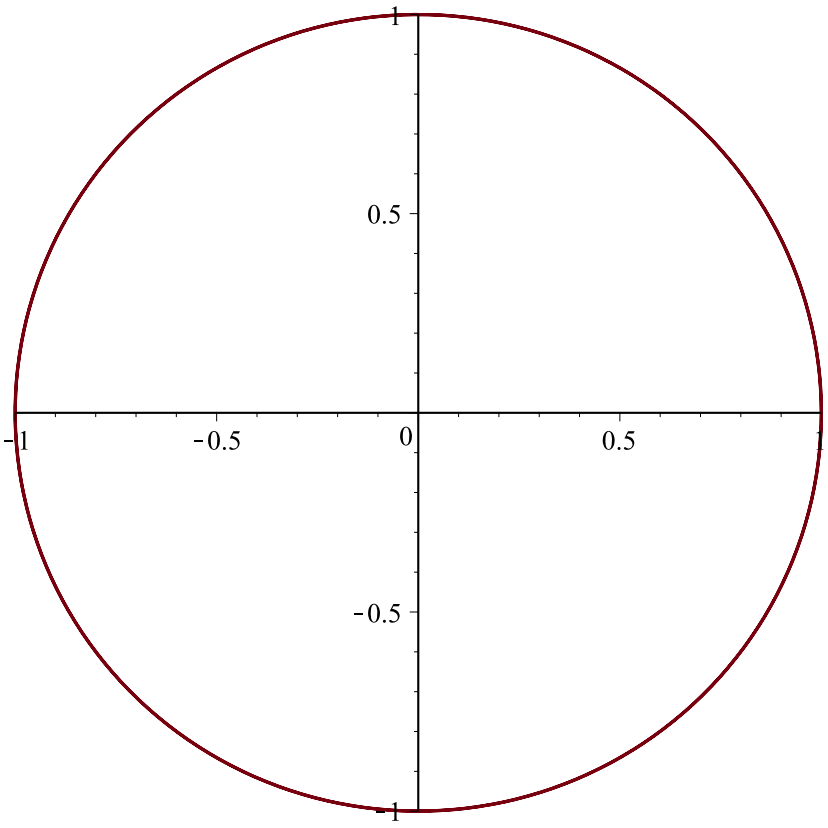
```
> FunUno := cos(2·theta);
```

$$FunUno := \cos(2\,\theta) \quad \textbf{(34)}$$

```
> FunDos := sin(2·theta)
```

$$FunDos := \sin(2\,\theta) \quad \textbf{(35)}$$

```
> plot([FunUno, FunDos, Intervalo])
```




```
> evalf(exp(1))
```

$$2.718281828 \quad (36)$$

```
> evalf(Pi)
```

$$3.141592654 \quad (37)$$

```
> evalf(pi)
```

$$\pi \quad (38)$$

```
> evalf(PI)
```

$$\Pi \quad (39)$$

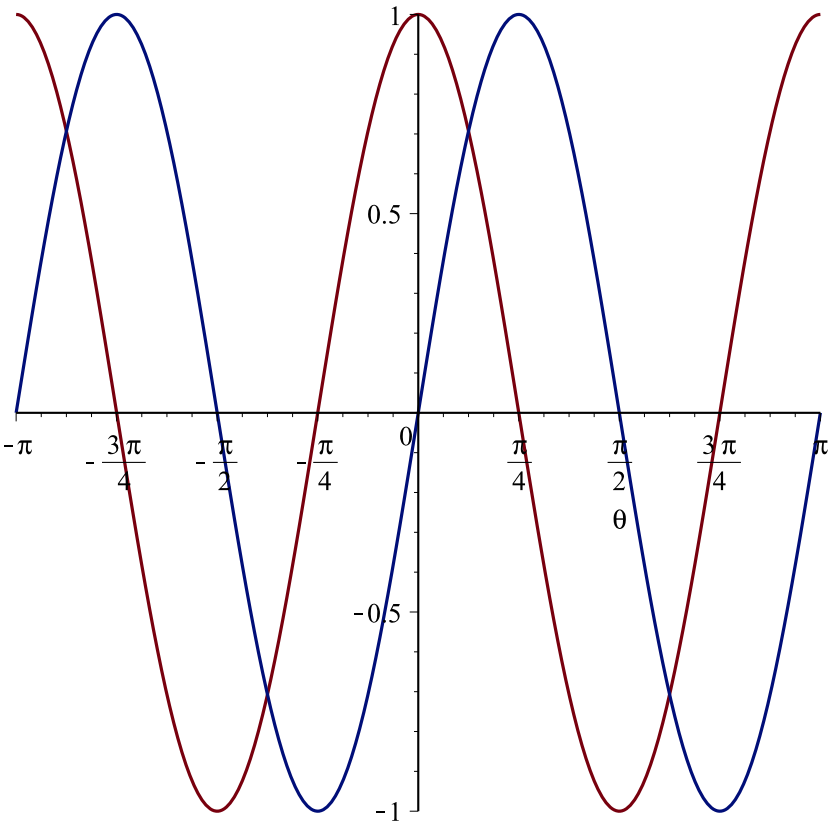
```
> theta
```

$$\theta \quad (40)$$

```
> evalf(Theta)
```

$$\Theta \quad (41)$$

```
> plot([FunUno, FunDos], Intervalo)
```


1
0.5
-0.5
-1
-π
-3π/4
-π/2
-π/4
0
π/4
π/2
3π/4
π
θ