

$$\begin{aligned}
& \text{ec1} := \text{diff}(x(t), t) = x(t) + 4 y(t); \\
& \text{ec1} := \frac{d}{dt} x(t) = x(t) + 4 y(t) \quad (1) \\
& \text{ec2} := \text{diff}(y(t), t) = x(t) + y(t); \\
& \text{ec2} := \frac{d}{dt} y(t) = x(t) + y(t) \quad (2) \\
& \text{sist} := \text{ec1}, \text{ec2}; \\
& \text{sist} := \frac{d}{dt} x(t) = x(t) + 4 y(t), \frac{d}{dt} y(t) = x(t) + y(t) \quad (3) \\
& \text{with(DEtools)} : \\
& \text{dsolve}(\{\text{sist}\}, \{x(t), y(t)\}); \\
& \left\{ x(t) = _C1 e^{3t} + _C2 e^{-t}, y(t) = \frac{_C1 e^{3t}}{2} - \frac{_C2 e^{-t}}{2} \right\} \quad (4) \\
& \text{restart}; \\
& \text{ec1} := \text{diff}(x(t), t) = 2 x(t) - y(t); \\
& \text{ec1} := \frac{d}{dt} x(t) = 2 x(t) - y(t) \quad (5) \\
& \text{ec2} := \text{diff}(y(t), t) = x(t) + 2 y(t); \\
& \text{ec2} := \frac{d}{dt} y(t) = x(t) + 2 y(t) \quad (6) \\
& \text{sist} := \text{ec1}, \text{ec2}; \\
& \text{sist} := \frac{d}{dt} x(t) = 2 x(t) - y(t), \frac{d}{dt} y(t) = x(t) + 2 y(t) \quad (7) \\
& \text{with(DEtools)} : \\
& \text{dsolve}(\{\text{sist}\}, \{x(t), y(t)\}); \\
& \{x(t) = e^{2t} (_C1 \sin(t) + _C2 \cos(t)), y(t) = e^{2t} (\sin(t) _C2 - \cos(t) _C1)\} \quad (8) \\
& \text{restart}; \\
& \text{ec1} := \text{diff}(x(t), t) = x(t) - y(t) + z(t); \\
& \text{ec1} := \frac{d}{dt} x(t) = x(t) - y(t) + z(t) \quad (9) \\
& \text{ec2} := \text{diff}(y(t), t) = x(t) + y(t) - z(t); \\
& \text{ec2} := \frac{d}{dt} y(t) = x(t) + y(t) - z(t) \quad (10) \\
& \text{ec3} := \text{diff}(z(t), t) = -y(t) + 2 z(t); \\
& \text{ec3} := \frac{d}{dt} z(t) = -y(t) + 2 z(t) \quad (11) \\
& \text{sist} := \text{ec1}, \text{ec2}, \text{ec3}; \\
& \text{sist} := \frac{d}{dt} x(t) = x(t) - y(t) + z(t), \frac{d}{dt} y(t) = x(t) + y(t) - z(t), \frac{d}{dt} z(t) = -y(t) + 2 z(t) \quad (12) \\
& \text{with(DEtools)} : \\
& \text{dsolve}(\{\text{sist}\}, \{x(t), y(t), z(t)\}); \\
& \{x(t) = _C1 e^{2t} + _C2 e^t + _C3 e^t t + _C3 e^t, y(t) = e^t (_C3 t + _C2 - _C3), z(t) = _C1 e^{2t} + _C2 e^t + _C3 e^t t\} \quad (13)
\end{aligned}$$

$$\begin{aligned} &> \text{restart}; \\ &> \text{ec1} := \text{diff}(x(t), t) = 5x(t) + 3y(t) + 1; \\ &\quad \text{ec1} := \frac{d}{dt} x(t) = 5x(t) + 3y(t) + 1 \end{aligned} \quad (14)$$

$$\begin{aligned} &> \text{ec2} := \text{diff}(y(t), t) = -6x(t) - 4y(t) + \exp(t); \\ &\quad \text{ec2} := \frac{d}{dt} y(t) = -6x(t) - 4y(t) + e^t \end{aligned} \quad (15)$$

$$\begin{aligned} &> \text{sist} := \text{ec1}, \text{ec2}; \\ &\quad \text{sist} := \frac{d}{dt} x(t) = 5x(t) + 3y(t) + 1, \frac{d}{dt} y(t) = -6x(t) - 4y(t) + e^t \end{aligned} \quad (16)$$

$$\begin{aligned} &> \text{with(DEtools)} : \\ &> \text{dsolve}(\{\text{sist}\}, \{x(t), y(t)\}); \\ &\quad \left\{ x(t) = e^{2t} _C2 + e^{-t} _C1 - \frac{3e^t}{2} - 2, y(t) = -e^{2t} _C2 - 2e^{-t} _C1 + 2e^t + 3 \right\} \end{aligned} \quad (17)$$

$$\begin{aligned} &> \text{restart}; \\ &> \text{ec1} := \text{diff}(x(t), t) = -x(t) + 3y(t) - 4z(t) + 25t; \\ &\quad \text{ec1} := \frac{d}{dt} x(t) = -x(t) + 3y(t) - 4z(t) + 25t \end{aligned} \quad (18)$$

$$\begin{aligned} &> \text{ec2} := \text{diff}(y(t), t) = -2x(t) - 6z(t) + 12\exp(t); \\ &\quad \text{ec2} := \frac{d}{dt} y(t) = -2x(t) - 6z(t) + 12e^t \end{aligned} \quad (19)$$

$$\begin{aligned} &> \text{ec3} := \text{diff}(z(t), t) = -2x(t) - 6y(t) + 6z(t) + 12; \\ &\quad \text{ec3} := \frac{d}{dt} z(t) = -2x(t) - 6y(t) + 6z(t) + 12 \end{aligned} \quad (20)$$

$$\begin{aligned} &> \text{sist} := \text{ec1}, \text{ec2}, \text{ec3}; \\ &\quad \text{sist} := \frac{d}{dt} x(t) = -x(t) + 3y(t) - 4z(t) + 25t, \frac{d}{dt} y(t) = -2x(t) - 6z(t) + 12e^t, \frac{d}{dt} z(t) \\ &\quad = -2x(t) - 6y(t) + 6z(t) + 12 \end{aligned} \quad (21)$$

$$\begin{aligned} &> \text{with(DEtools)} : \\ &> \text{dsolve}(\{\text{sist}\}, \{x(t), y(t), z(t)\}); \\ &\quad \left\{ x(t) = -e^t + 15t - \frac{49}{10} + _C1 e^{-3t} + _C2 e^{-2t} + _C3 e^{10t}, y(t) = -10t - \frac{7_C2 e^{-2t}}{5} + 2e^t \right. \\ &\quad \left. + \frac{233}{30} + _C3 e^{10t} - \frac{10_C1 e^{-3t}}{3}, z(t) = -5t - \frac{4_C2 e^{-2t}}{5} + 2e^t + \frac{33}{10} - 2_C3 e^{10t} \right. \\ &\quad \left. - 2_C1 e^{-3t} \right\} \end{aligned} \quad (22)$$

$$\begin{aligned} &> \text{ec1} := \text{diff}(x(t), t) = x(t) + 4y(t); \\ &\quad \text{ec1} := \frac{d}{dt} x(t) = x(t) + 4y(t) \end{aligned} \quad (23)$$

$$\begin{aligned} &> \text{ec2} := \text{diff}(y(t), t) = x(t) + y(t); \\ &\quad \text{ec2} := \frac{d}{dt} y(t) = x(t) + y(t) \end{aligned} \quad (24)$$

$$> \text{sist} := \text{ec1}, \text{ec2};$$

$$\text{sist} := \frac{d}{dt} x(t) = x(t) + 4y(t), \frac{d}{dt} y(t) = x(t) + y(t) \quad (25)$$

> *cond* := *x*(0) = 1, *y*(0) = 2;

$$\text{cond} := x(0) = 1, y(0) = 2 \quad (26)$$

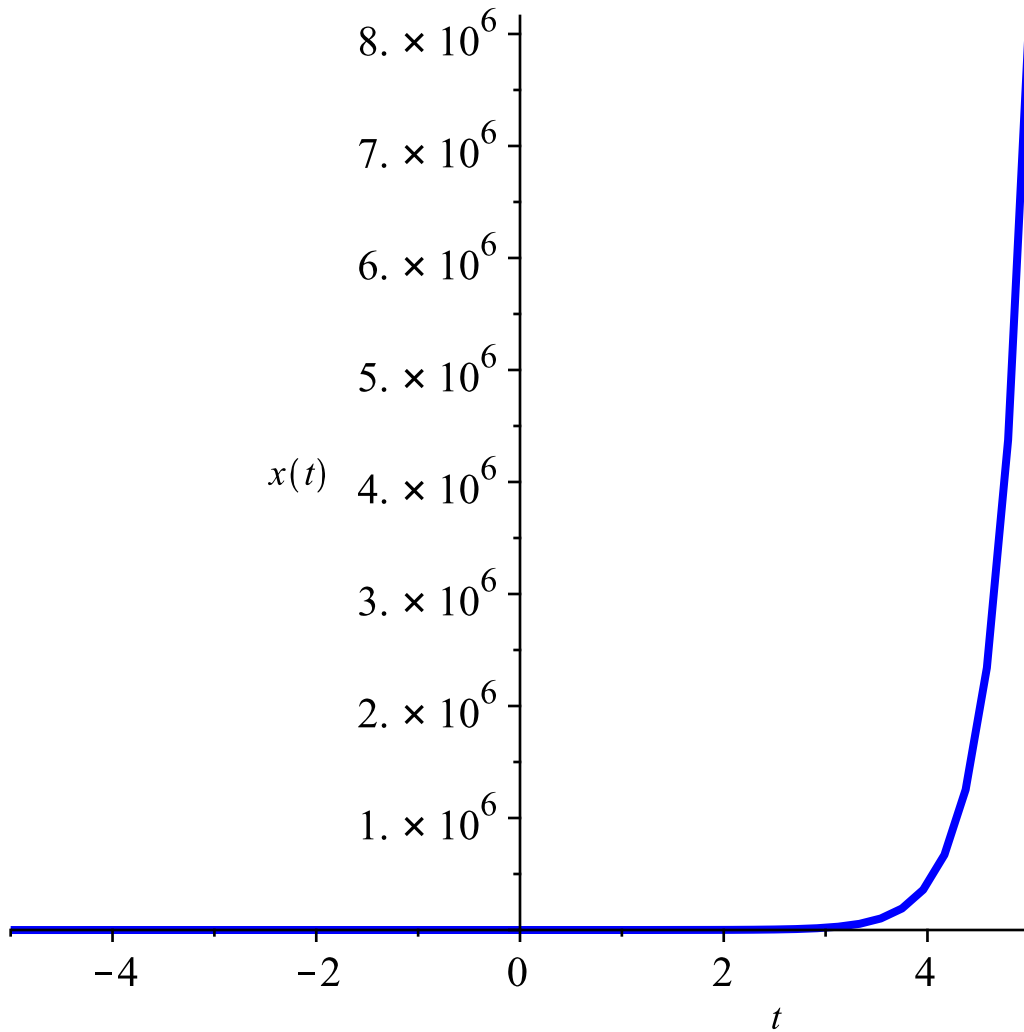
> *with*(*DEtools*) :

> *dsolve*({*sist*, *cond*}, {*x*(*t*), *y*(*t*)});

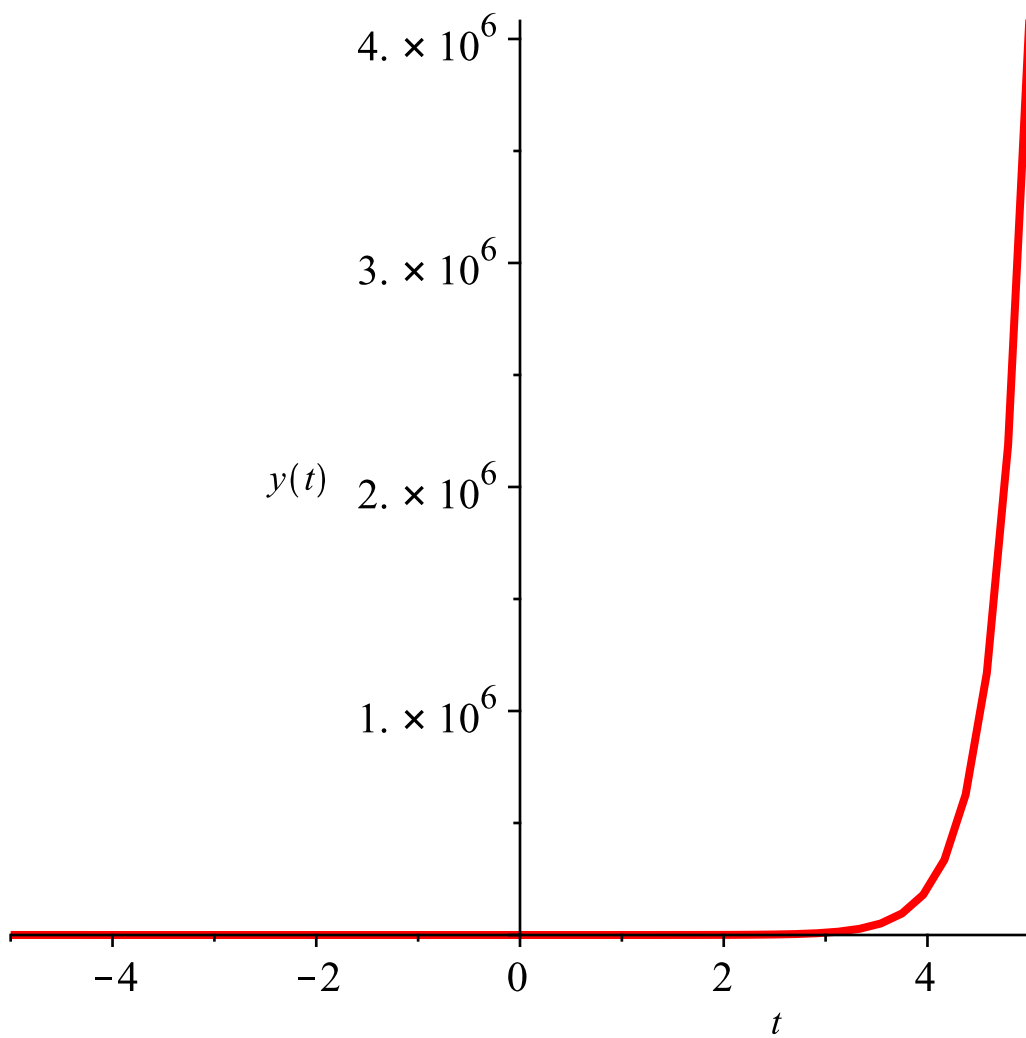
$$\left\{ x(t) = -\frac{3e^{-t}}{2} + \frac{5e^{3t}}{2}, y(t) = \frac{3e^{-t}}{4} + \frac{5e^{3t}}{4} \right\} \quad (27)$$

> *with*(*plots*) :

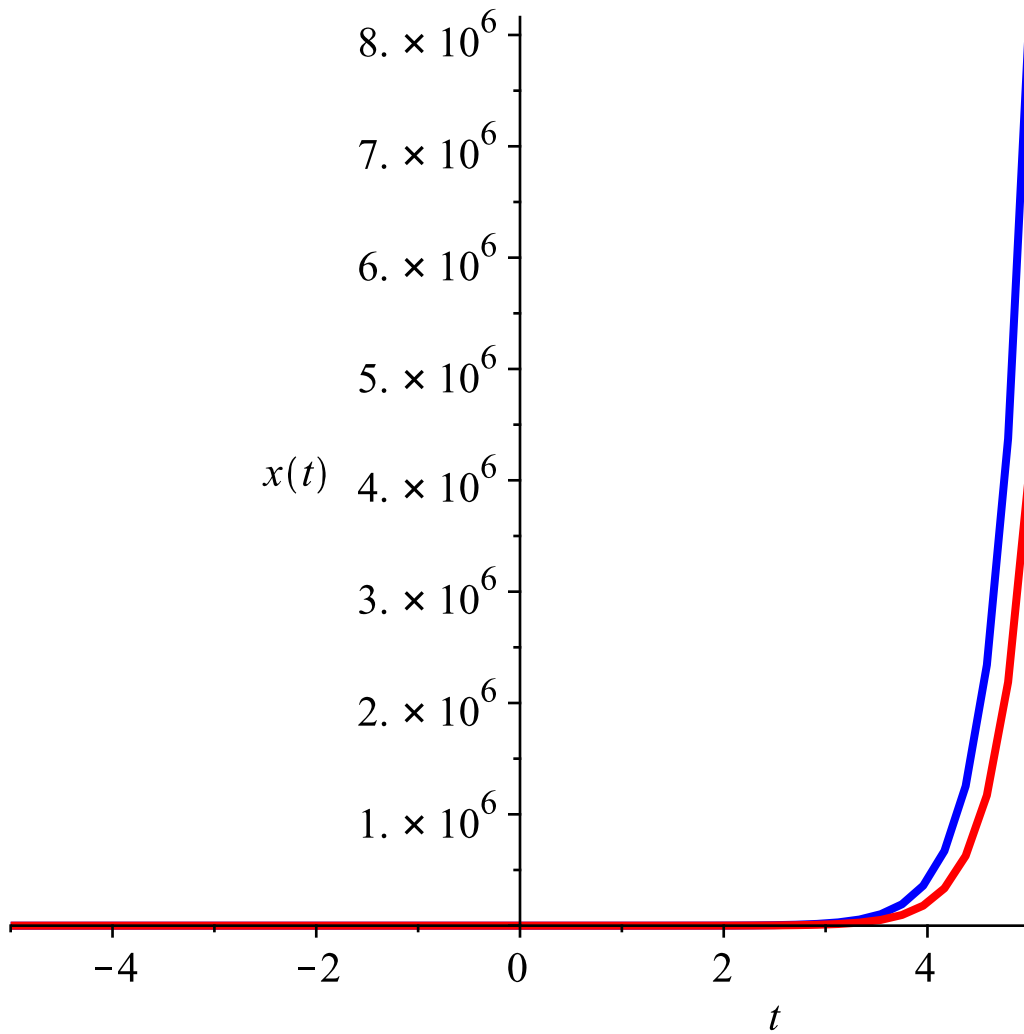
> *xx* := *DEplot*([*sist*], [*x*, *y*], *t* = -5 .. 5, [[*cond*]], *linecolor* = *blue*, *scene* = [*t*, *x*(*t*)]);



> *yy* := *DEplot*([*sist*], [*x*, *y*], *t* = -5 .. 5, [[*cond*]], *linecolor* = *red*, *scene* = [*t*, *y*(*t*)]);



```
=  
> display([xx, yy]);
```



$$\begin{aligned} &> \text{restart;} \\ &> \text{ec1} := \text{diff}(x(t), t) = x(t) + 2 y(t) + \exp(-t); \\ &\quad \text{ec1} := \frac{d}{dt} x(t) = x(t) + 2 y(t) + e^{-t} \end{aligned} \quad (28)$$

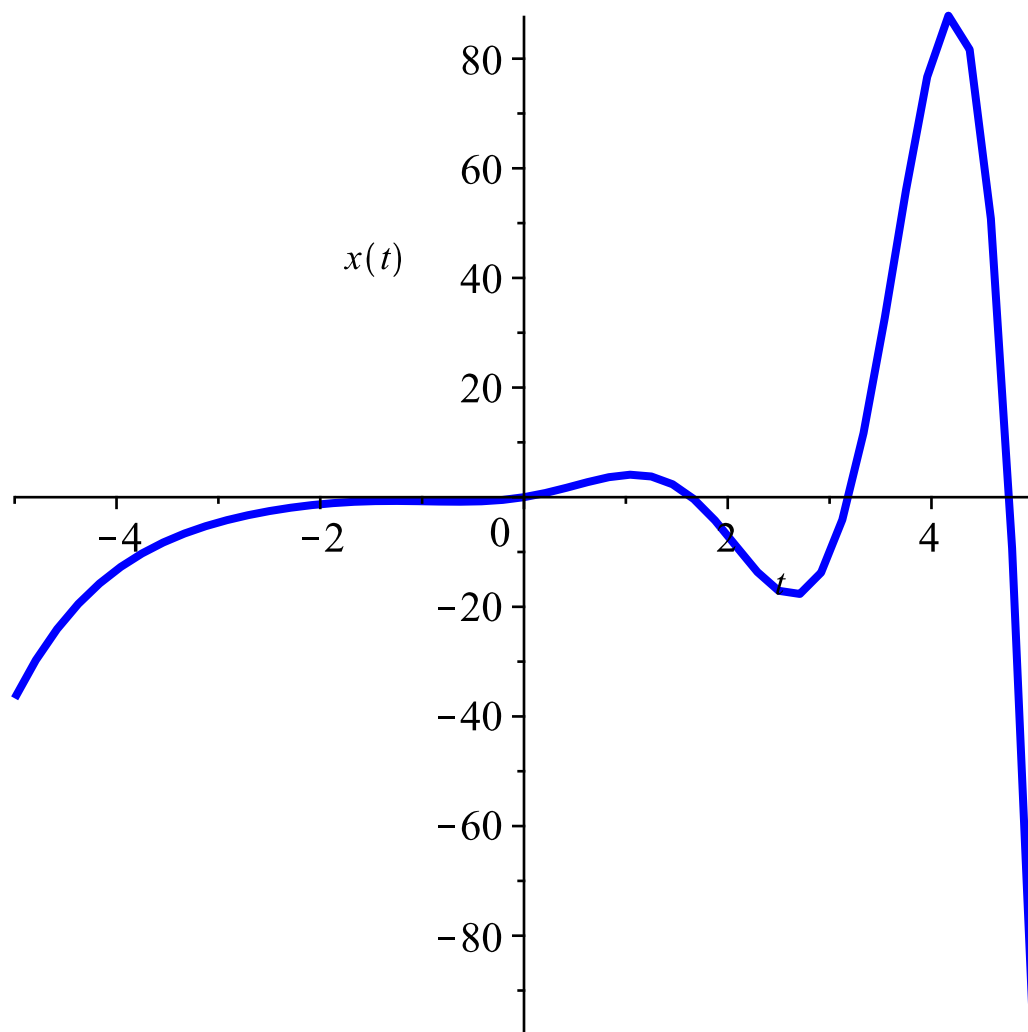
$$\begin{aligned} &> \text{ec2} := \text{diff}(y(t), t) = -2 x(t) + y(t) + 1; \\ &\quad \text{ec2} := \frac{d}{dt} y(t) = -2 x(t) + y(t) + 1 \end{aligned} \quad (29)$$

$$\begin{aligned} &> \text{cond} := x(0) = 0, y(0) = 1; \\ &\quad \text{cond} := x(0) = 0, y(0) = 1 \end{aligned} \quad (30)$$

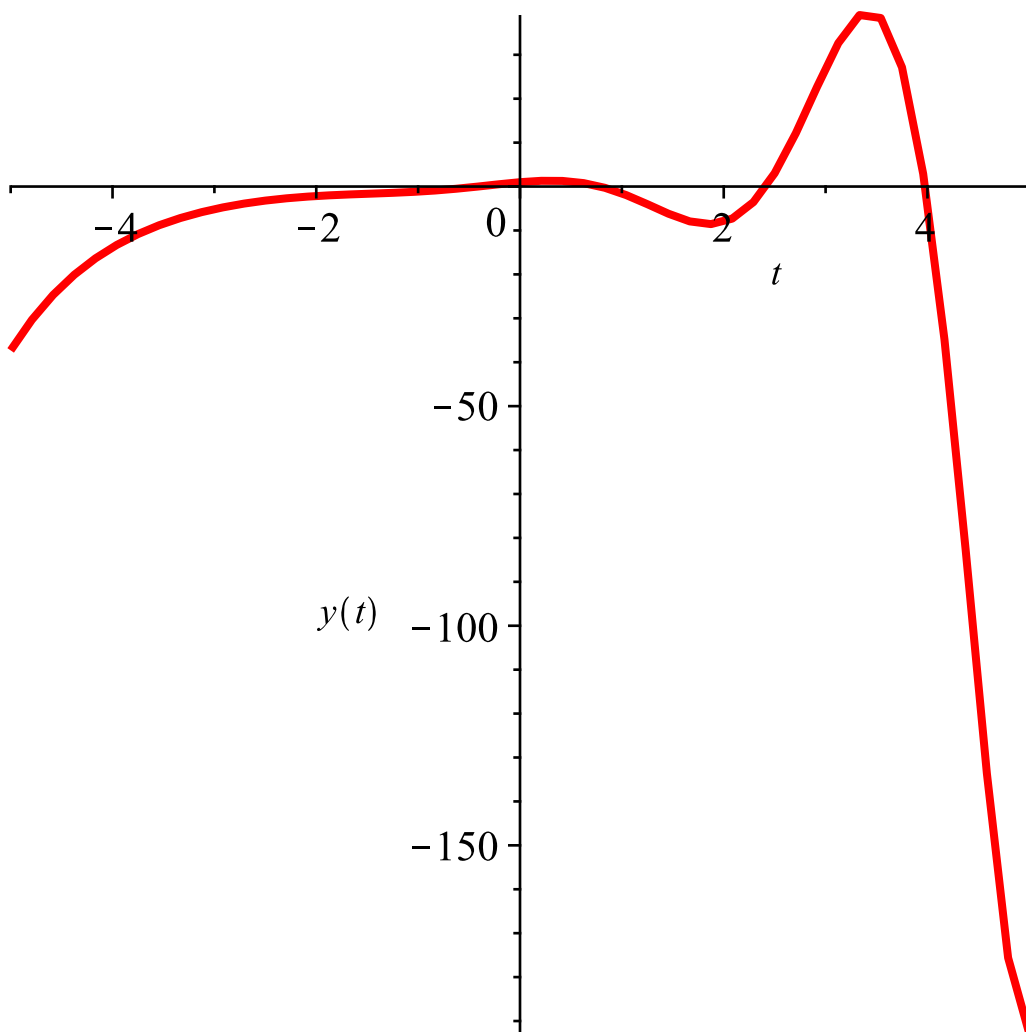
$$\begin{aligned} &> \text{with(DEtools)} : \\ &> \text{sist} := \text{ec1}, \text{ec2}; \\ &\quad \text{sist} := \frac{d}{dt} x(t) = x(t) + 2 y(t) + e^{-t}, \frac{d}{dt} y(t) = -2 x(t) + y(t) + 1 \end{aligned} \quad (31)$$

$$\begin{aligned} &> \text{dsolve}(\{\text{sist}, \text{cond}\}, \{x(t), y(t)\}); \\ &\quad \left\{ x(t) = -\frac{3 e^t \cos(2 t)}{20} + \frac{29 e^t \sin(2 t)}{20} - \frac{e^{-t}}{4} + \frac{2}{5}, y(t) = \frac{3 e^t \sin(2 t)}{20} + \frac{29 e^t \cos(2 t)}{20} \right. \\ &\quad \left. - \frac{1}{5} - \frac{e^{-t}}{4} \right\} \end{aligned} \quad (32)$$

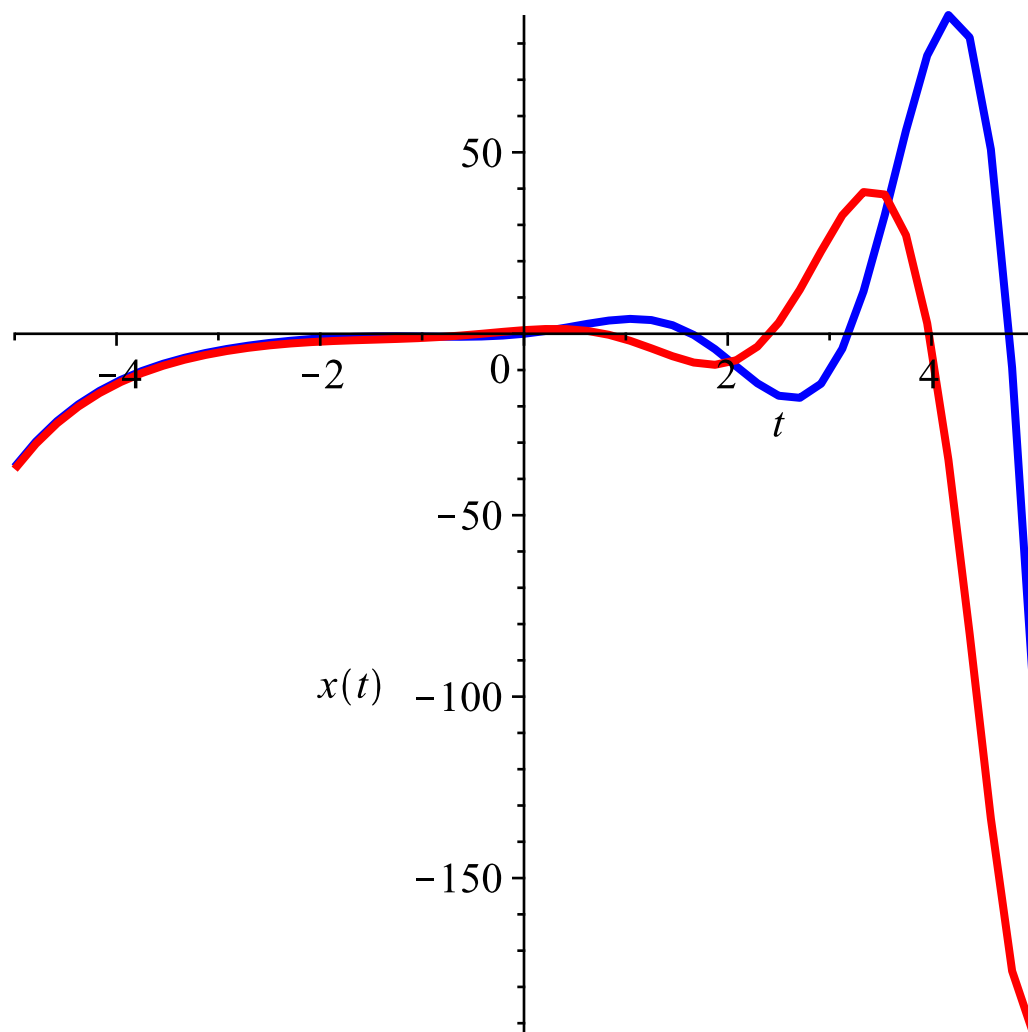
```
> with(plots) :
> xx := DEplot([sist], [x, y], t=-5..5, [[cond]], linecolor=blue, scene=[t, x(t)]);
```



```
> yy := DEplot([sist], [x, y], t=-5..5, [[cond]], linecolor=red, scene=[t, y(t)]);
```



```
> display([xx,yy]);
```



```
> restart;
```

```
> ec1 := diff(x(t), t) = -x(t) + 3 y(t) + 3 z(t) + 27 t^2;
```

$$ec1 := \frac{d}{dt} x(t) = -x(t) + 3 y(t) + 3 z(t) + 27 t^2 \quad (33)$$

```
> ec2 := diff(y(t), t) = 2 x(t) - 2 y(t) - 5 z(t) + 3 t;
```

$$ec2 := \frac{d}{dt} y(t) = 2 x(t) - 2 y(t) - 5 z(t) + 3 t \quad (34)$$

```
> ec3 := diff(z(t), t) = -2 x(t) + 3 y(t) + 6 z(t) + 3;
```

$$ec3 := \frac{d}{dt} z(t) = -2 x(t) + 3 y(t) + 6 z(t) + 3 \quad (35)$$

```
> sist := ec1, ec2, ec3;
```

$$sist := \frac{d}{dt} x(t) = -x(t) + 3 y(t) + 3 z(t) + 27 t^2, \frac{d}{dt} y(t) = 2 x(t) - 2 y(t) - 5 z(t) + 3 t, \quad (36)$$

$$\frac{d}{dt} z(t) = -2 x(t) + 3 y(t) + 6 z(t) + 3$$

```
> cond := x(0) = 50, y(0) = -30, z(0) = 26;
```

$$cond := x(0) = 50, y(0) = -30, z(0) = 26 \quad (37)$$

```
> with(DEtools) :
```

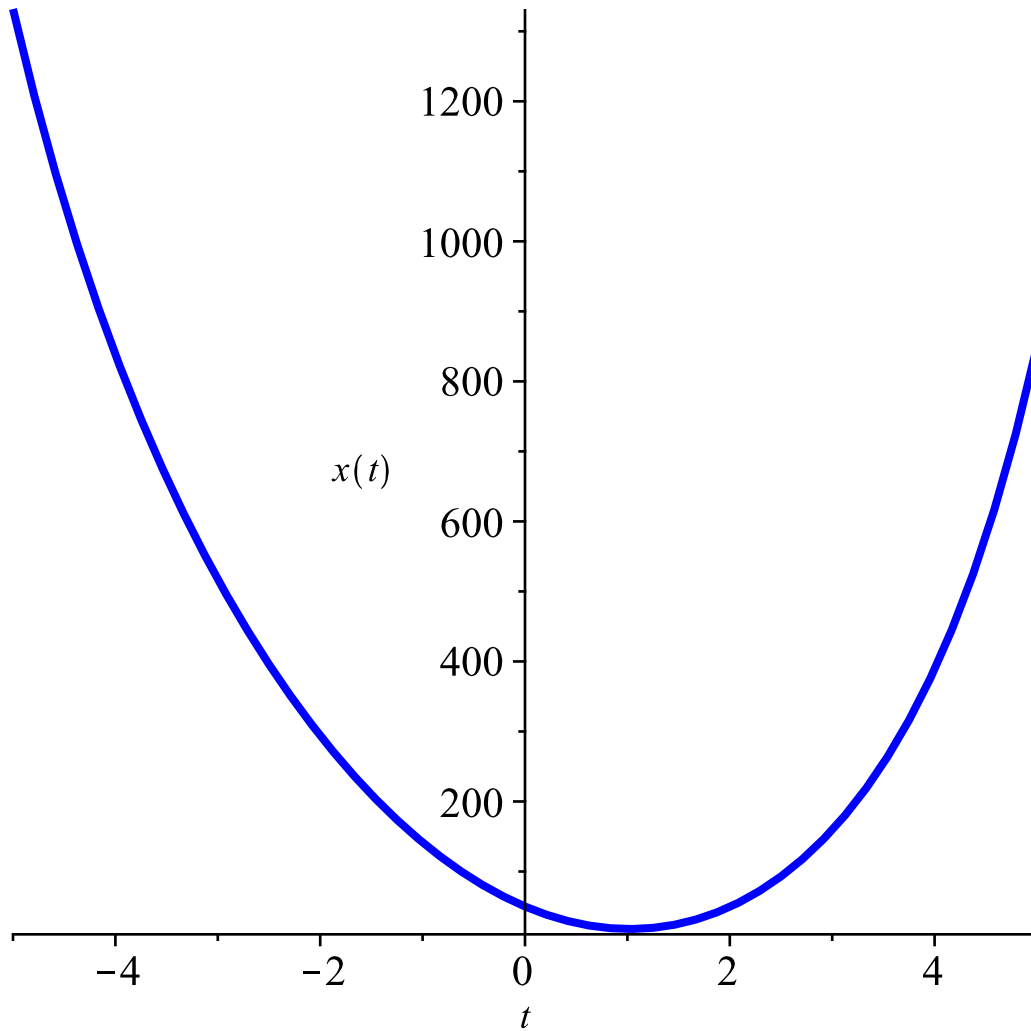


```
> dsolve( {sist, cond}, {x(t), y(t), z(t)} );
```

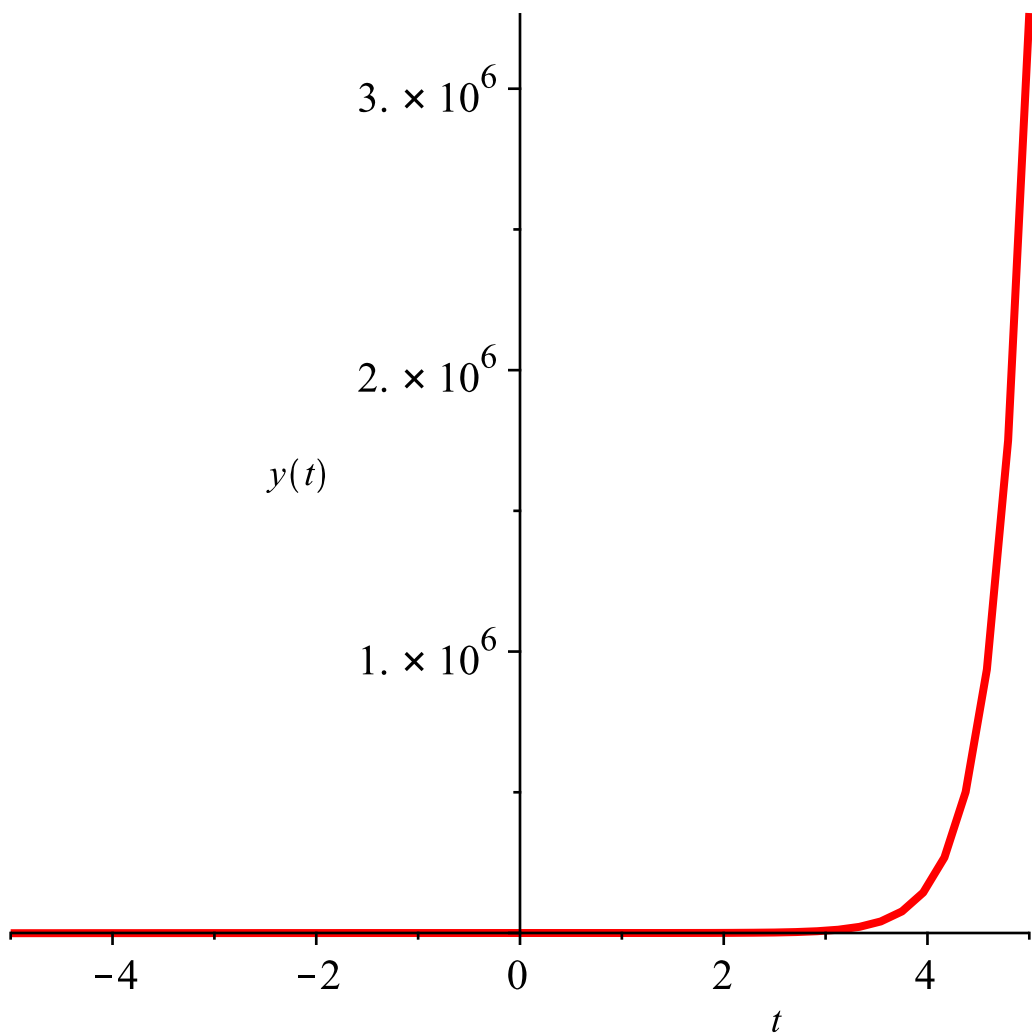
$$\{x(t) = 2 e^{-t} + 3 e^t + 27 t^2 - 63 t + 45, y(t) = e^{3t} + 2 e^t - 18 t^2 + 24 t - 32 - e^{-t}, z(t) = -e^{3t} - 27 t + 18 t^2 + 26 + e^{-t}\} \quad (38)$$

```
> with(plots) :
```

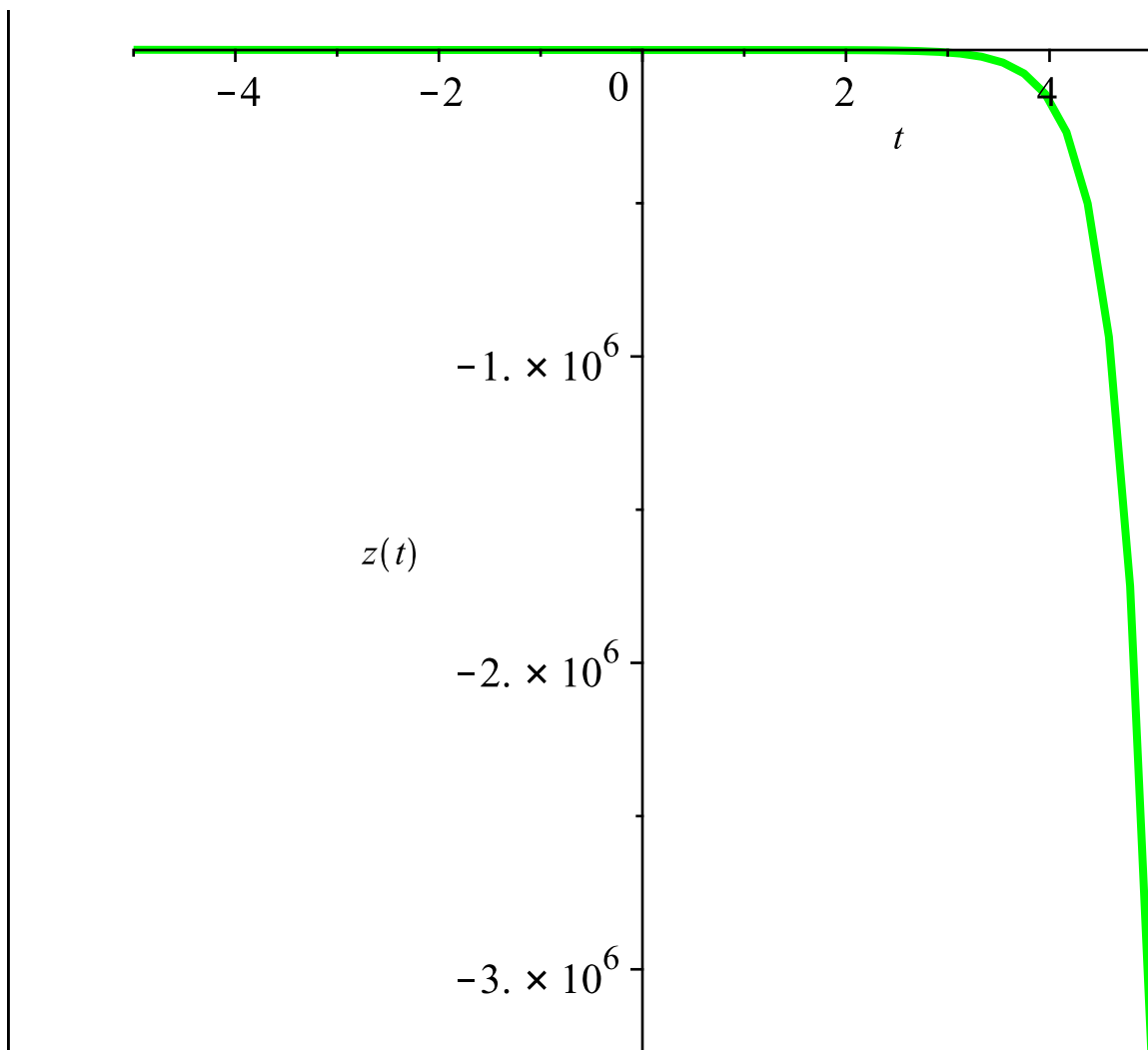
```
> xx := DEplot( [sist], [x, y, z], t=-5 ..5, [[cond]], linecolor=blue, scene=[t, x(t)] );
```



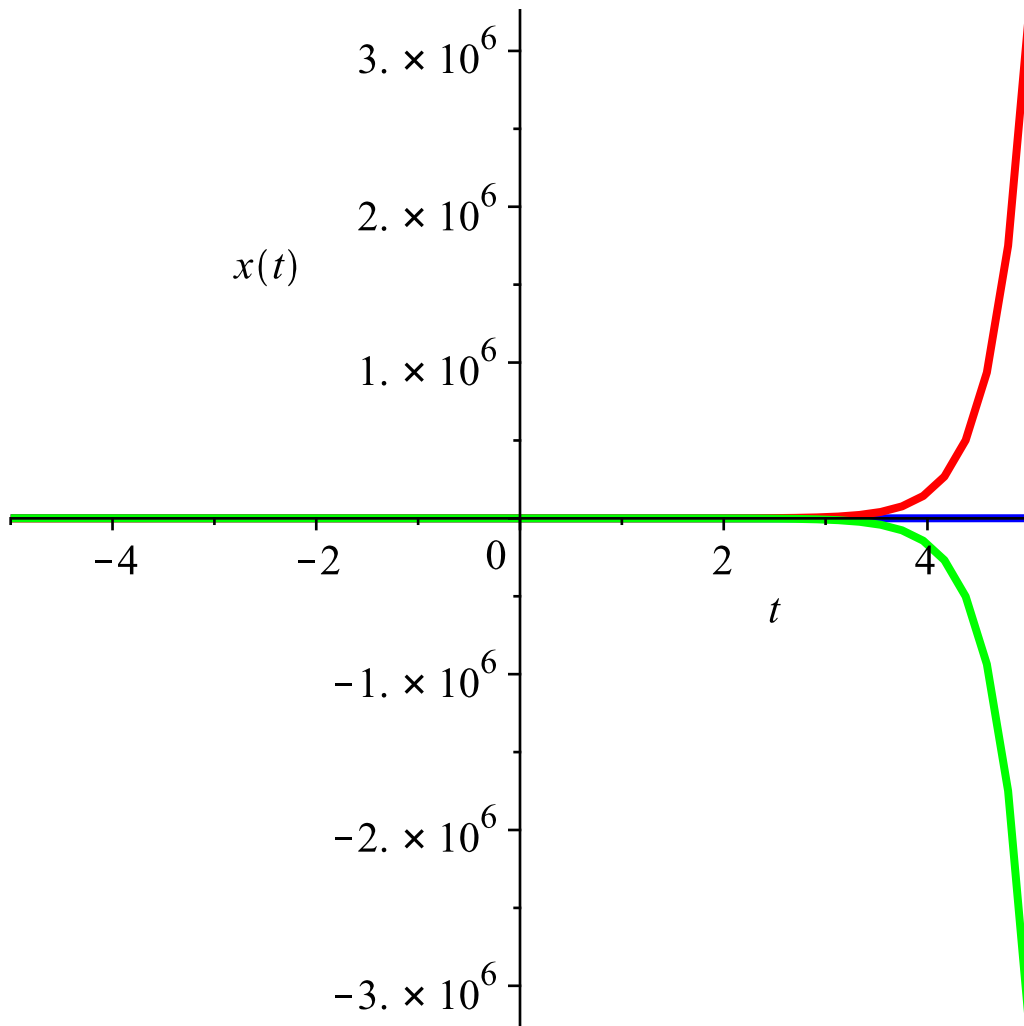
```
> yy := DEplot( [sist], [x, y, z], t=-5 ..5, [[cond]], linecolor=red, scene=[t, y(t)] );
```



```
=
> zz := DEplot([sist], [x, y, z], t=-5..5, [[cond]], linecolor=green, scene=[t, z(t)]);
```



```
=  
> display([xx, yy, zz]);
```



```
> restart;
```

```
> ec1 := diff(x(t), t) = x(t) + y(t);
```

$$ec1 := \frac{d}{dt} x(t) = x(t) + y(t) \quad (39)$$

```
> ec2 := diff(y(t), t) = -2 x(t) + 4 y(t);
```

$$ec2 := \frac{d}{dt} y(t) = -2 x(t) + 4 y(t) \quad (40)$$

```
> sist := ec1, ec2;
```

$$sist := \frac{d}{dt} x(t) = x(t) + y(t), \frac{d}{dt} y(t) = -2 x(t) + 4 y(t) \quad (41)$$

```
> cond := x(0) = 3, y(0) = 0;
```

$$cond := x(0) = 3, y(0) = 0 \quad (42)$$

```
> with(DEtools) :
```

```
> sol := dsolve( {sist, cond}, {x(t), y(t)} );
```

$$sol := \{x(t) = 6 e^{2t} - 3 e^{3t}, y(t) = 6 e^{2t} - 6 e^{3t}\} \quad (43)$$

```
> limit(sol[1], t = infinity);
```

$$\lim_{t \rightarrow \infty} x(t) = -\infty \quad (44)$$

$$\begin{aligned} &> \text{limit}(\text{sol}[2], t = \text{infinity}); \\ &\qquad \lim_{t \rightarrow \infty} y(t) = -\infty \end{aligned} \tag{45}$$

$$\begin{aligned} &> \text{cond2} := x(0) = 2, y(0) = 3; \\ &\qquad \text{cond2} := x(0) = 2, y(0) = 3 \end{aligned} \tag{46}$$

$$\begin{aligned} &> \text{sol2} := \text{dsolve}(\{\text{sist}, \text{cond2}\}, \{x(t), y(t)\}); \\ &\qquad \text{sol2} := \{x(t) = e^{2t} + e^{3t}, y(t) = e^{2t} + 2e^{3t}\} \end{aligned} \tag{47}$$

$$\begin{aligned} &> \text{limit}(\text{sol2}[1], t = \text{infinity}); \\ &\qquad \lim_{t \rightarrow \infty} x(t) = \infty \end{aligned} \tag{48}$$

$$\begin{aligned} &> \text{limit}(\text{sol2}[2], t = \text{infinity}); \\ &\qquad \lim_{t \rightarrow \infty} y(t) = \infty \end{aligned} \tag{49}$$

$$\begin{aligned} &> \text{cond3} := x(0) = -3, y(0) = 0; \\ &\qquad \text{cond3} := x(0) = -3, y(0) = 0 \end{aligned} \tag{50}$$

$$\begin{aligned} &> \text{sol3} := \text{dsolve}(\{\text{sist}, \text{cond3}\}, \{x(t), y(t)\}); \\ &\qquad \text{sol3} := \{x(t) = -6e^{2t} + 3e^{3t}, y(t) = -6e^{2t} + 6e^{3t}\} \end{aligned} \tag{51}$$

$$\begin{aligned} &> \text{limit}(\text{sol3}[1], t = \text{infinity}); \\ &\qquad \lim_{t \rightarrow \infty} x(t) = \infty \end{aligned} \tag{52}$$

$$\begin{aligned} &> \text{limit}(\text{sol3}[2], t = \text{infinity}); \\ &\qquad \lim_{t \rightarrow \infty} y(t) = \infty \end{aligned} \tag{53}$$

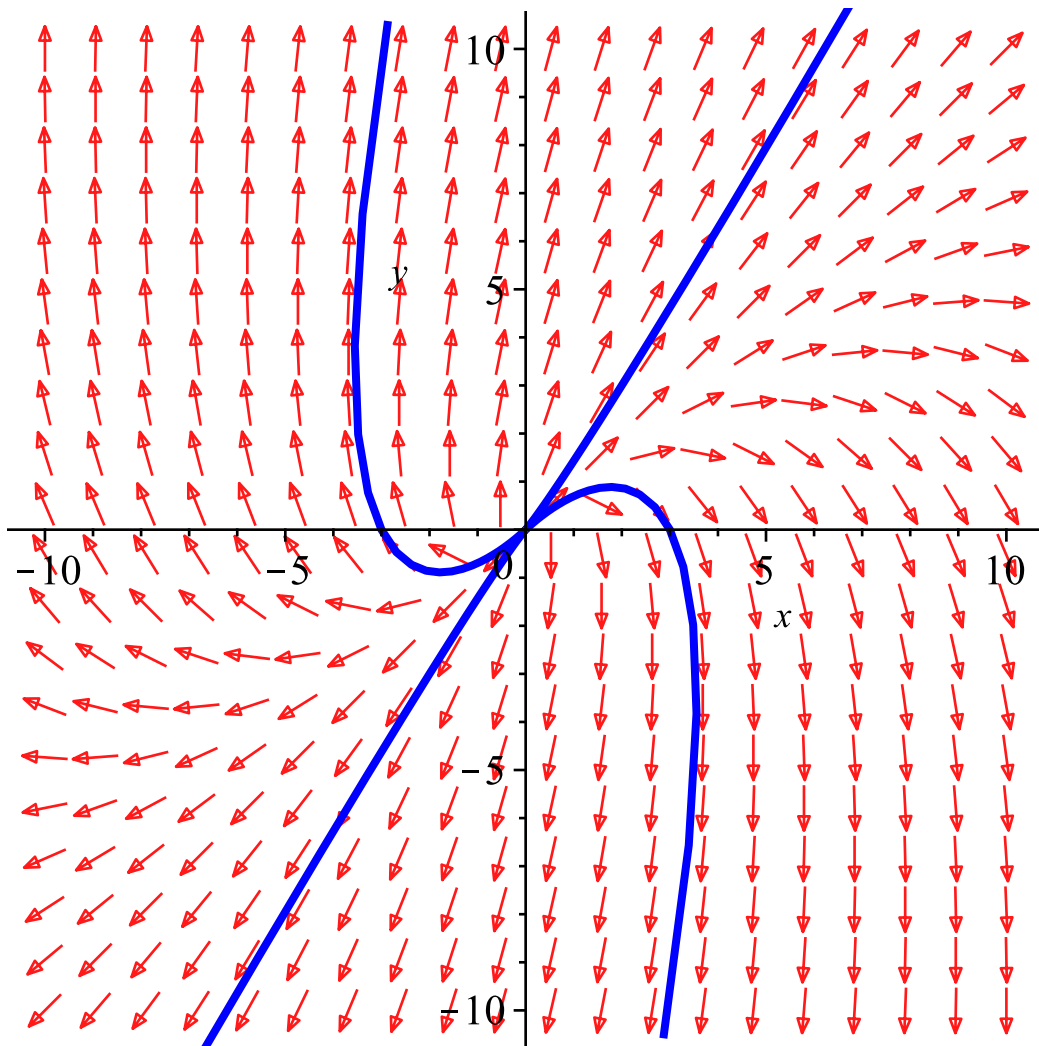
$$\begin{aligned} &> \text{cond4} := x(0) = -2, y(0) = -3; \\ &\qquad \text{cond4} := x(0) = -2, y(0) = -3 \end{aligned} \tag{54}$$

$$\begin{aligned} &> \text{sol4} := \text{dsolve}(\{\text{sist}, \text{cond4}\}, \{x(t), y(t)\}); \\ &\qquad \text{sol4} := \{x(t) = -e^{2t} - e^{3t}, y(t) = -e^{2t} - 2e^{3t}\} \end{aligned} \tag{55}$$

$$\begin{aligned} &> \text{limit}(\text{sol4}[1], t = \text{infinity}); \\ &\qquad \lim_{t \rightarrow \infty} x(t) = -\infty \end{aligned} \tag{56}$$

$$\begin{aligned} &> \text{limit}(\text{sol4}[2], t = \text{infinity}); \\ &\qquad \lim_{t \rightarrow \infty} y(t) = -\infty \end{aligned} \tag{57}$$

> with(plots) :
 > DEplot([sist], [x(t), y(t)], t = -4 .. 4, x = -10 .. 10, y = -10 .. 10, [[cond], [cond2], [cond3],
 [cond4]], arrows = medium, linecolor = blue, stepsize = 0.1);



```
> restart;
> ec1 := diff(x(t), t) = y(t);
```

$$ec1 := \frac{d}{dt} x(t) = y(t) \quad (58)$$

```
> ec2 := diff(y(t), t) = -x(t) - 2 y(t);
```

$$ec2 := \frac{d}{dt} y(t) = -x(t) - 2 y(t) \quad (59)$$

```
> sist := ec1, ec2;
```

$$sist := \frac{d}{dt} x(t) = y(t), \frac{d}{dt} y(t) = -x(t) - 2 y(t) \quad (60)$$

```
> with(DEtools) :
```

```
> sol := dsolve({sist}, {x(t), y(t)});
```

$$sol := \{x(t) = e^{-t} (_C2 t + _C1), y(t) = -e^{-t} (_C2 t + _C1 - _C2)\} \quad (61)$$

```
> limit(sol[1], t=infinity);
```

$$\lim_{t \rightarrow \infty} x(t) = 0 \quad (62)$$

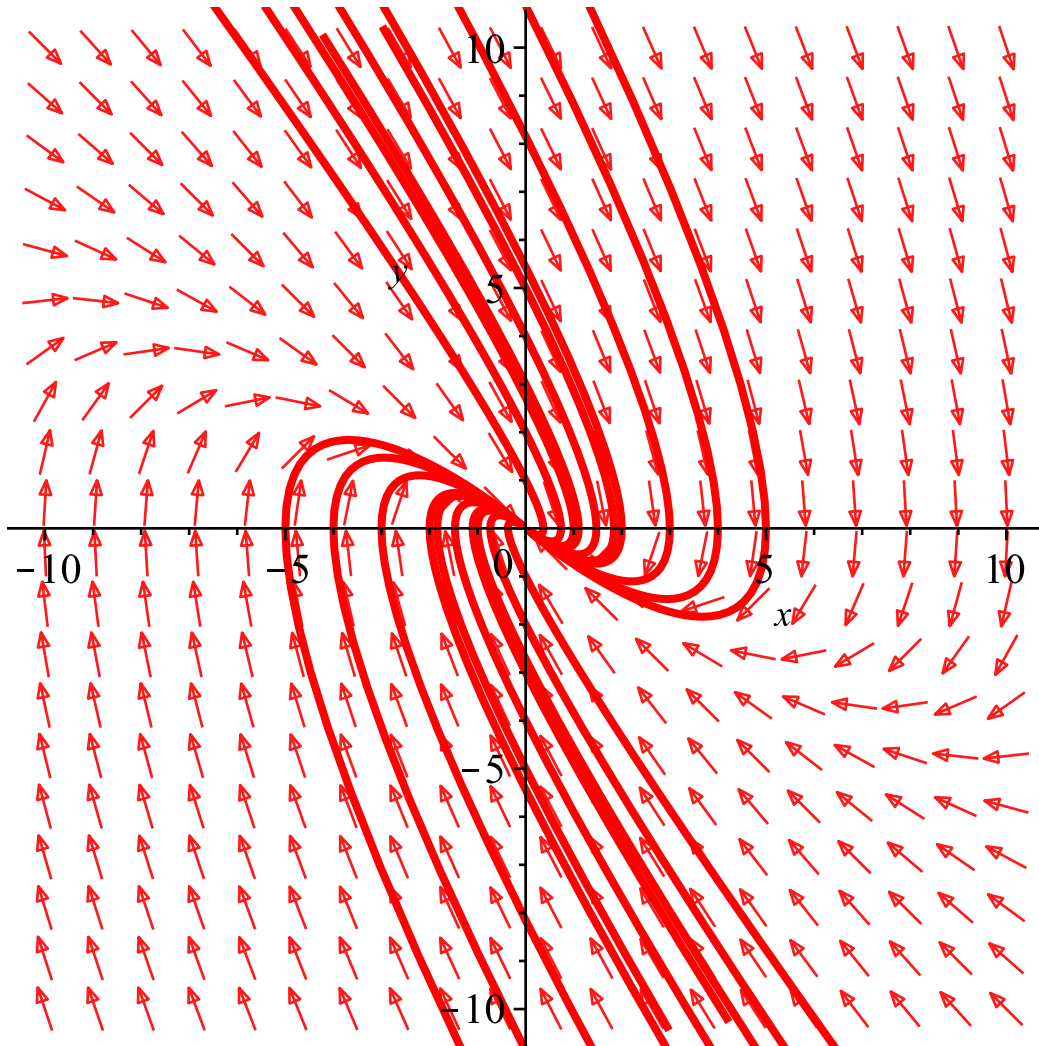
```
> limit(sol[2], t=infinity);
```

$$\lim_{t \rightarrow \infty} y(t) = 0 \quad (63)$$

```

> cond := [x(0)=0, y(0)=i]$i=1..5, [x(0)=0, y(0)=-i]$i=1..5,
[x(0)=i, y(0)=0]$i=1..5, [x(0)=-i, y(0)=0]$i=1..5;
cond := [x(0)=0, y(0)=1], [x(0)=0, y(0)=2], [x(0)=0, y(0)=3], [x(0)=0, y(0)=4],
[x(0)=0, y(0)=5], [x(0)=0, y(0)=-1], [x(0)=0, y(0)=-2], [x(0)=0, y(0)
=-3], [x(0)=0, y(0)=-4], [x(0)=0, y(0)=-5], [x(0)=1, y(0)=0], [x(0)=2,
y(0)=0], [x(0)=3, y(0)=0], [x(0)=4, y(0)=0], [x(0)=5, y(0)=0], [x(0)=-1,
y(0)=0], [x(0)=-2, y(0)=0], [x(0)=-3, y(0)=0], [x(0)=-4, y(0)=0], [x(0)
=-5, y(0)=0]
> with(plots) :
> DEplot([sist], [x(t), y(t)], t=-5..5, x=-10..10, y=-10..10, [cond], arrows=medium,
linecolor=red, stepsize=0.1);

```



```

> restart;
> ec1 := diff(x(t), t) = 2 x(t) + y(t);

```

$$ec1 := \frac{d}{dt} x(t) = 2 x(t) + y(t) \quad (65)$$

```

> ec2 := diff(y(t), t) = x(t) + 2 y(t);

```

$$ec2 := \frac{d}{dt} y(t) = x(t) + 2 y(t) \quad (66)$$

```
> sist := ec1, ec2;
```

$$\text{sist} := \frac{d}{dt} x(t) = 2x(t) + y(t), \frac{d}{dt} y(t) = x(t) + 2y(t) \quad (67)$$

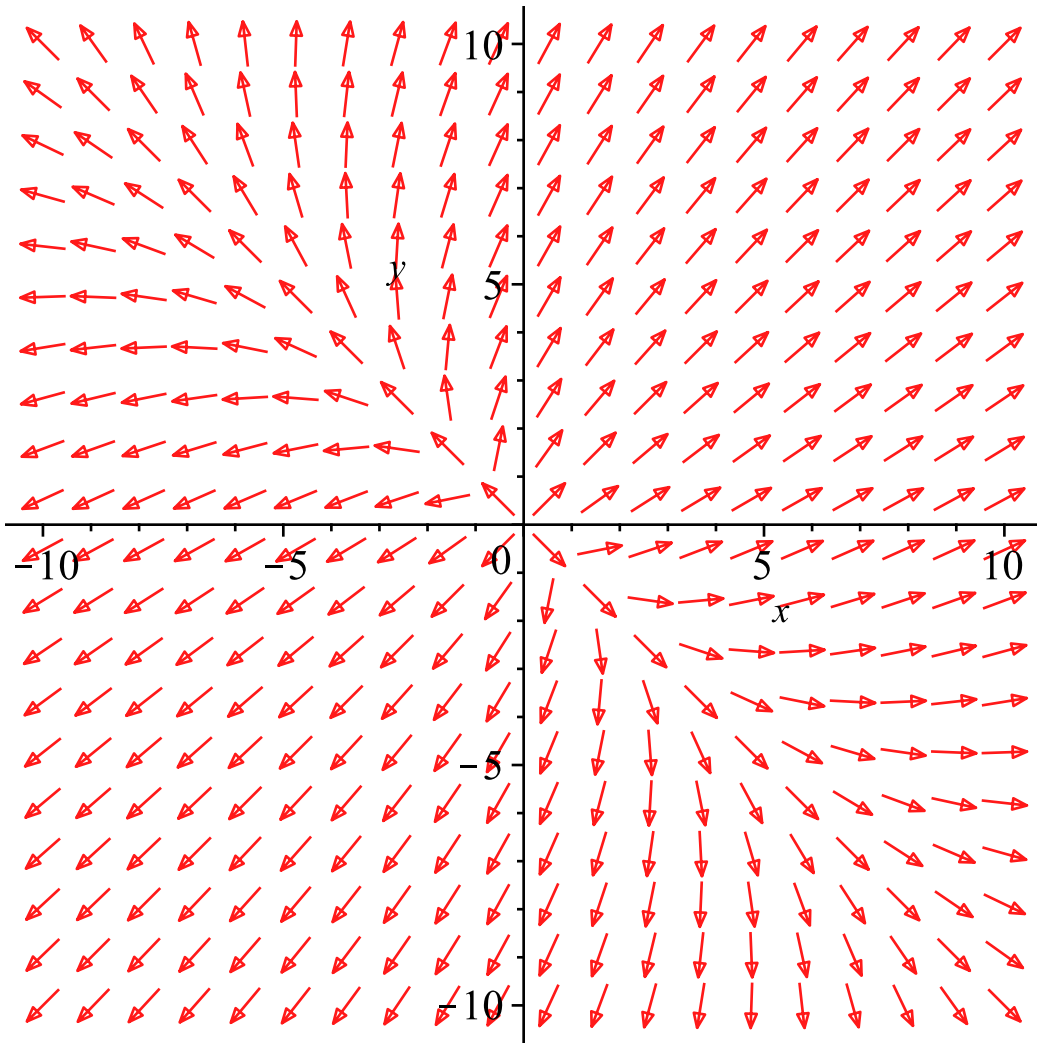
```
> with(plots) :
```

```
> with(DEtools) :
```

```
> dsolve( {sist}, {x(t), y(t)} );
```

$$\{x(t) = _C1 e^{3t} + _C2 e^t, y(t) = _C1 e^{3t} - _C2 e^t\} \quad (68)$$

```
> DEplot( [sist], [x(t), y(t)], t=-5..5, x=-10..10, y=-10..10, arrows = medium);
```



```
> restart
```

```
> ec1 := diff(x(t), t) = -x(t) - y(t);
```

$$ec1 := \frac{d}{dt} x(t) = -x(t) - y(t) \quad (69)$$

```
> ec2 := diff(y(t), t) = x(t) - y(t);
```

$$ec2 := \frac{d}{dt} y(t) = x(t) - y(t) \quad (70)$$

```
> sist := ec1, ec2;
```

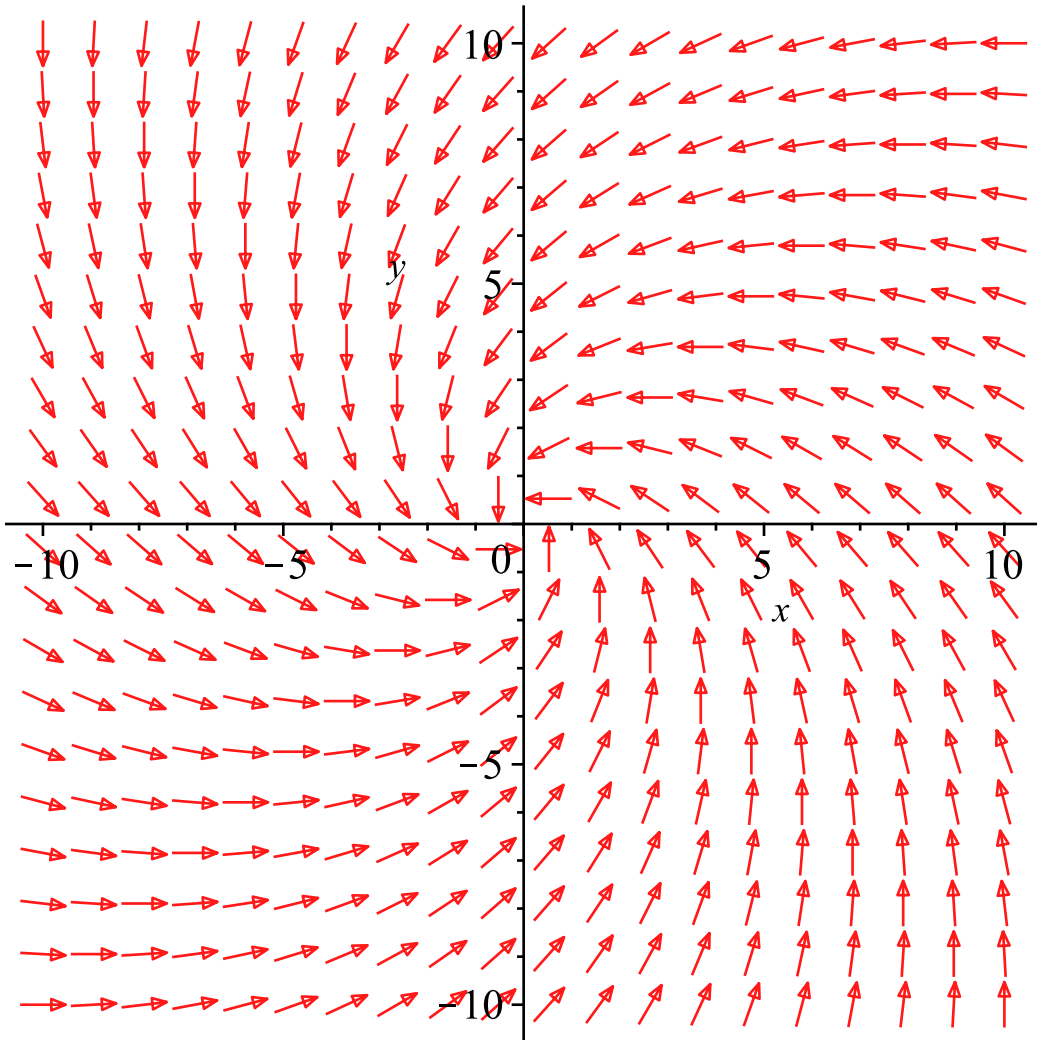
$$\text{sist} := \frac{d}{dt} x(t) = -x(t) - y(t), \frac{d}{dt} y(t) = x(t) - y(t) \quad (71)$$


```
> dsolve( {sist}, {x(t), y(t)});
```

$$\{x(t) = e^{-t} (-C2 \cos(t) + C1 \sin(t)), y(t) = -e^{-t} (\cos(t) C1 - \sin(t) C2)\}$$
(72)

```
> with(DEtools) : with(plots) :
```

```
> DEplot( [sist], [x(t), y(t)], t=-5..5, x=-10..10, y=-10..10, arrows=medium);
```



```
> restart
```

```
> ec1 := diff(x(t), t) = y(t);
```

$$ec1 := \frac{d}{dt} x(t) = y(t)$$
(73)

```
> ec2 := diff(y(t), t) = -x(t);
```

$$ec2 := \frac{d}{dt} y(t) = -x(t)$$
(74)

```
> sist := ec1, ec2;
```

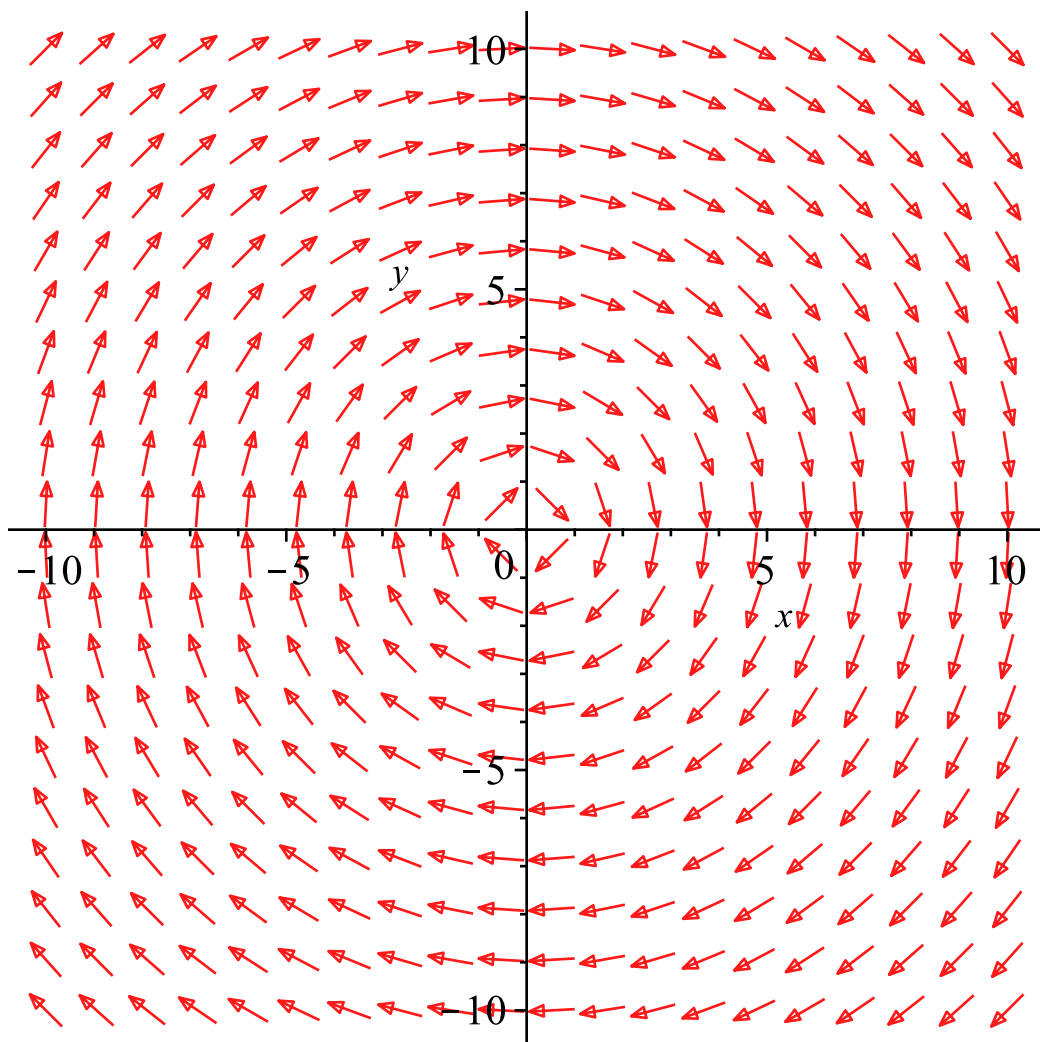
$$sist := \frac{d}{dt} x(t) = y(t), \frac{d}{dt} y(t) = -x(t)$$
(75)

```
> dsolve( {sist}, {x(t), y(t)});
```

$$\{x(t) = C1 \sin(t) + C2 \cos(t), y(t) = C1 \cos(t) - C2 \sin(t)\}$$
(76)

```
> with(DEtools) : with(plots) :
```

```
> DEplot( [sist], [x(t), y(t)], t=-5..5, x=-10..10, y=-10..10, arrows=medium);
```



```
> restart
```

```
> ec1 := diff(x(t), t) = -2 x(t);
```

$$ec1 := \frac{d}{dt} x(t) = -2 x(t) \quad (77)$$

```
> ec2 := diff(y(t), t) = -4 x(t) - 2 y(t);
```

$$ec2 := \frac{d}{dt} y(t) = -4 x(t) - 2 y(t) \quad (78)$$

```
> sist := ec1, ec2;
```

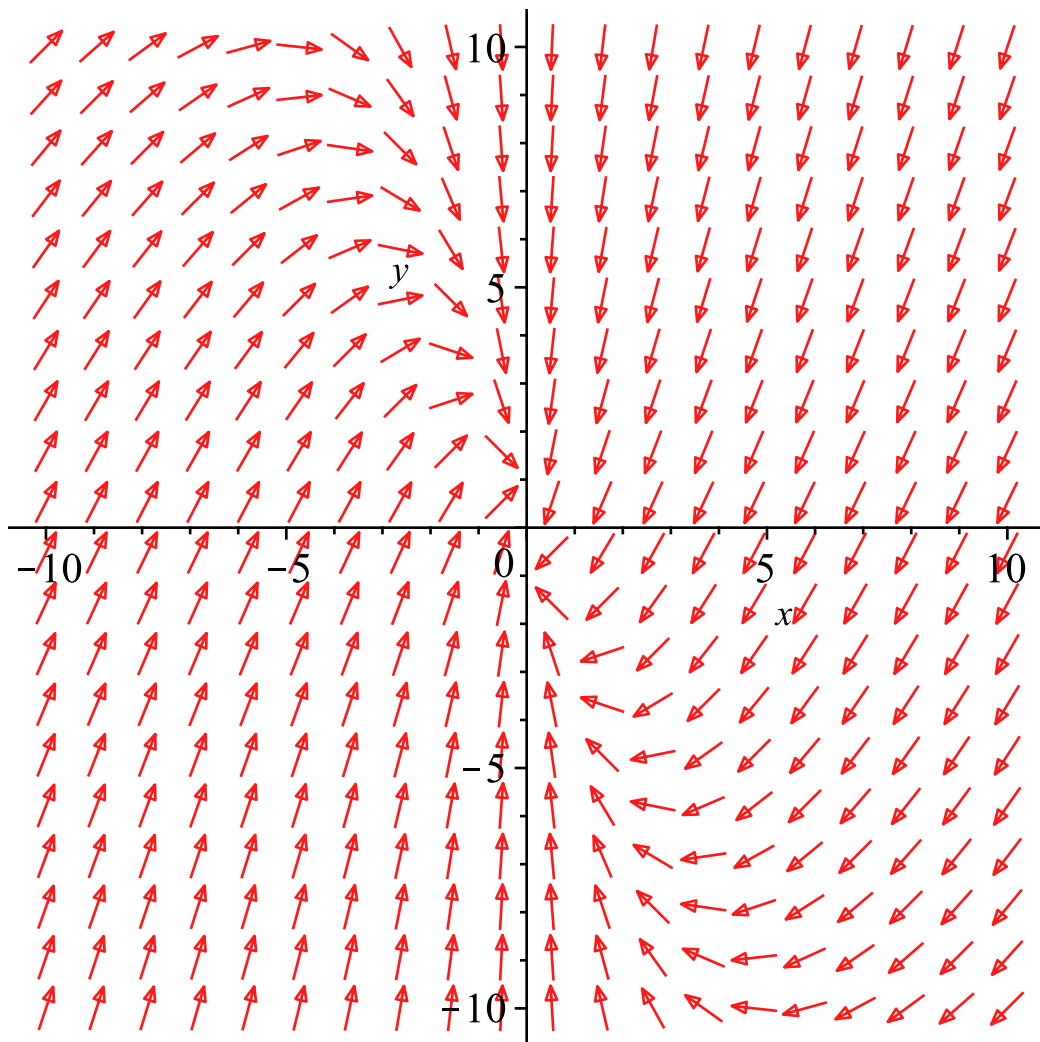
$$sist := \frac{d}{dt} x(t) = -2 x(t), \frac{d}{dt} y(t) = -4 x(t) - 2 y(t) \quad (79)$$

```
> dsolve( {sist}, {x(t), y(t)} );
```

$$\{x(t) = _C2 e^{-2t}, y(t) = (-4 _C2 t + _C1) e^{-2t}\} \quad (80)$$

```
> with(DEtools) : with(plots) :
```

```
> DEplot( [sist], [x(t), y(t)], t = -5 .. 5, x = -10 .. 10, y = -10 .. 10, arrows = medium);
```



```
> restart
```

```
> ec1 := diff(x(t), t) = x(t) - 4 y(t);
```

$$ec1 := \frac{d}{dt} x(t) = x(t) - 4 y(t) \quad (81)$$

```
> ec2 := diff(y(t), t) = 5 x(t) - 3 y(t);
```

$$ec2 := \frac{d}{dt} y(t) = 5 x(t) - 3 y(t) \quad (82)$$

```
> sist := ec1, ec2;
```

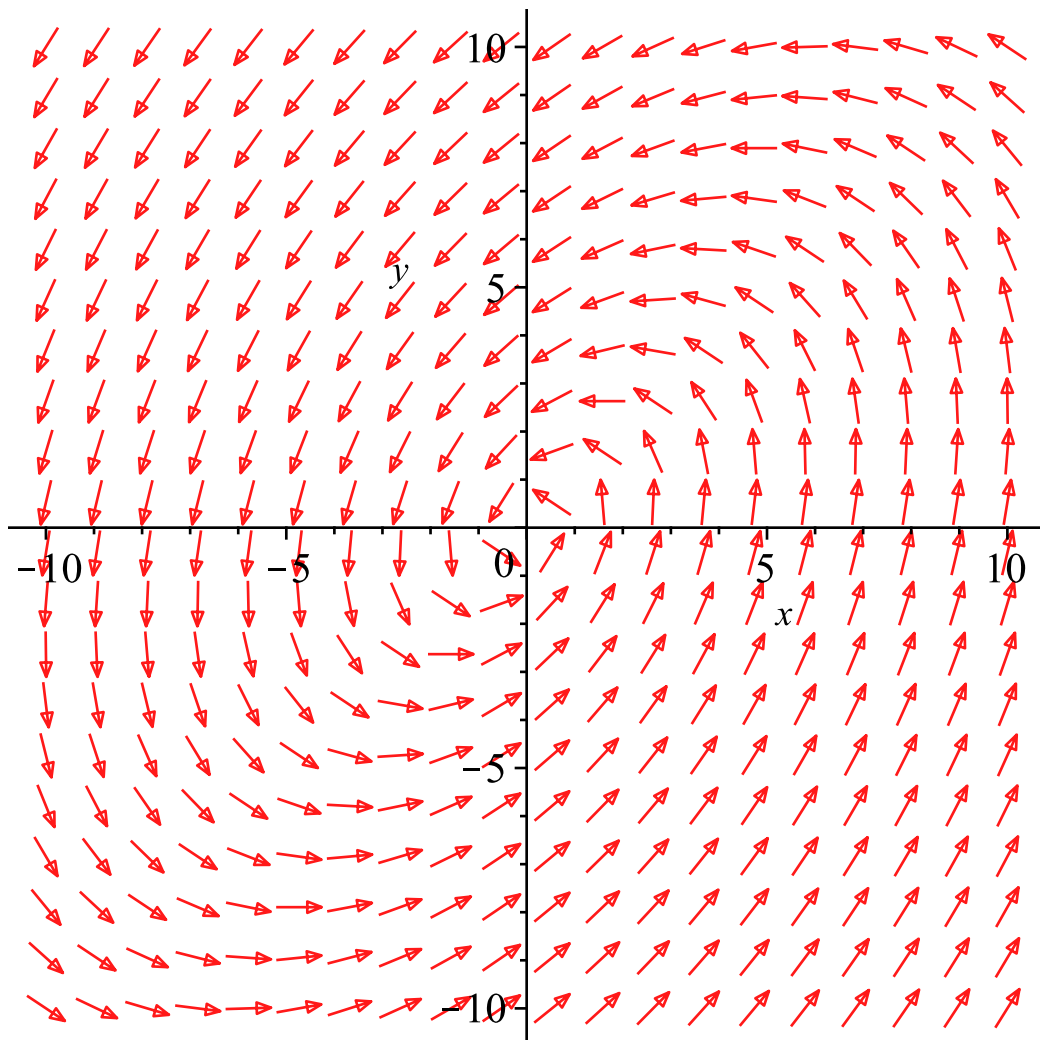
$$sist := \frac{d}{dt} x(t) = x(t) - 4 y(t), \quad \frac{d}{dt} y(t) = 5 x(t) - 3 y(t) \quad (83)$$

```
> dsolve( {sist}, {x(t), y(t)} );
```

$$\left\{ \begin{aligned} x(t) &= e^{-t} (\sin(4 t) _C1 + \cos(4 t) _C2), y(t) \\ &= \frac{e^{-t} (\sin(4 t) _C1 + 2 \sin(4 t) _C2 - 2 \cos(4 t) _C1 + \cos(4 t) _C2)}{2} \end{aligned} \right\} \quad (84)$$

```
> with(DEtools) : with(plots) :
```

```
> DEplot( [sist], [x(t), y(t)], t=-5..5, x=-10..10, y=-10..10, arrows = medium);
```



```
> restart
```

```
> ec1 := diff(x(t), t) = 3 x(t) - y(t);
```

$$ec1 := \frac{d}{dt} x(t) = 3 x(t) - y(t) \quad (85)$$

```
> ec2 := diff(y(t), t) = y(t);
```

$$ec2 := \frac{d}{dt} y(t) = y(t) \quad (86)$$

```
> sist := ec1, ec2;
```

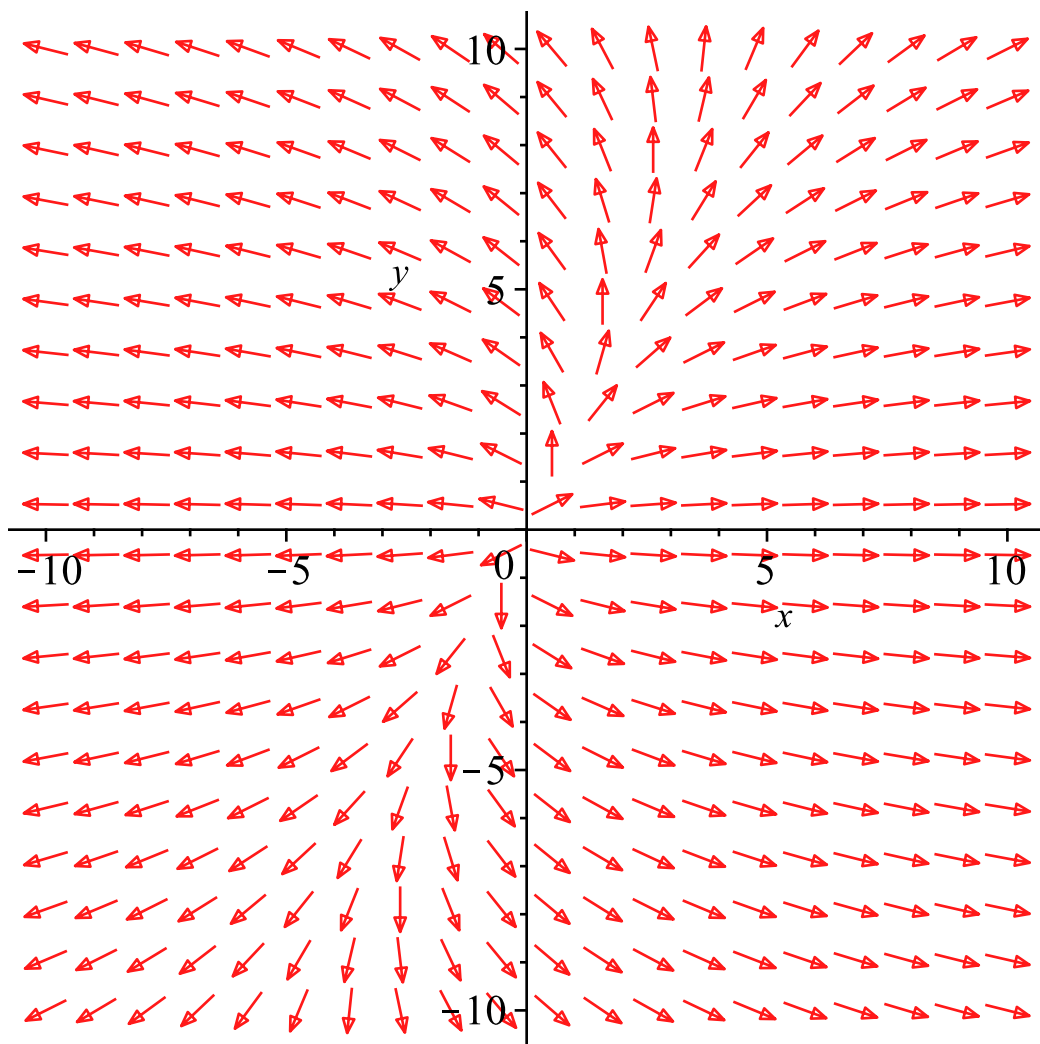
$$sist := \frac{d}{dt} x(t) = 3 x(t) - y(t), \frac{d}{dt} y(t) = y(t) \quad (87)$$

```
> dsolve( {sist}, {x(t), y(t)} );
```

$$\left\{ x(t) = -\frac{C2 e^t}{2} + e^{3t} _C1, y(t) = _C2 e^t \right\} \quad (88)$$

```
> with(DEtools) : with(plots) :
```

```
> DEplot( [sist], [x(t), y(t)], t = -5..5, x = -10..10, y = -10..10, arrows = medium);
```



#sistemele b,c,d,e au limitele $x(t), y(t)$ egale cu 0