> $i1 := int\left(\frac{\sin(x)}{x}, x = -5..5\right)$

$$i1 := 2\,\mathrm{Si}(5) \tag{1}$$

> $evalf(i1, 3)$

$$3.10 \tag{2}$$

> $with(Student[LinearAlgebra]) : with(LinearAlgebra) : with(linalg) :$

> $A := Matrix([[1, 7, 3, 3], [-2, 5, 1, 1], [1, 2, -2, 1], [1, -1, 3, 1]])$

$$A := \begin{bmatrix} 1 & 7 & 3 & 3 \\ -2 & 5 & 1 & 1 \\ 1 & 2 & -2 & 1 \\ 1 & -1 & 3 & 1 \end{bmatrix} \tag{3}$$

> $eg := Eigenvalues(A)$

(4)

$$eg := \begin{bmatrix} \cdots \\ \cdots \\ \cdots \\ \cdots \end{bmatrix} \tag{4}$$

> $evalf(eg, 3)$

$$\begin{bmatrix} 3.52 + 2.39\,\mathrm{I} \\ 3.52 - 2.39\,\mathrm{I} \\ 0.90 \\ -2.94 \end{bmatrix} \tag{5}$$

> $eq := diff(u(t), t) = u(t) \cdot (1 - u(t))$

$$eq := \frac{\mathrm{d}}{\mathrm{d}t} u(t) = u(t)\ (1 - u(t)) \tag{6}$$

> $ic := u(0) = 0.1$

$$ic := u(0) = 0.1 \tag{7}$$

> $du := dsolve(\{eq, ic\}, u(t))$

$$du := u(t) = \frac{1}{1 + 9\,\mathrm{e}^{-t}} \tag{8}$$

> $l(t) := rhs(du)$

$$l := t \mapsto rhs(du) \tag{9}$$

> $\mathrm{lim} := limit(l(t), t = 100)$

$$\mathrm{lim} := \frac{1}{1 + 9\,\mathrm{e}^{-100}} \tag{10}$$

> $evalf(\mathrm{lim})$

$$1. \tag{11}$$

> $eq1 := diff(x(t), t) = x(t) \cdot \left(1 - x(t) - \frac{1}{2} y(t)\right)$

$$eq1 := \frac{\mathrm{d}}{\mathrm{d}t} x(t) = x(t) \left(1 - x(t) - \frac{y(t)}{2}\right) \tag{12}$$

> $eq2 := diff(y(t), t) = y(t) \cdot (1 - y(t))$

$$eq2 := \frac{\mathrm{d}}{\mathrm{d}t} y(t) = y(t)\ (1 - y(t)) \tag{13}$$

> $with(plots)$:

> $sol1 := dsolve\left(\left\{eq1, eq2, x(0) = \frac{1}{4}, y(0) = \frac{1}{2}\right\}, \{x(t), y(t)\}\right)$

$$sol1 := \left\{x(t) = \frac{\mathrm{e}^{-t}}{2\sqrt{(1 + \mathrm{e}^{-t})\,\mathrm{e}^{-t}}\sqrt{(\mathrm{e}^{-t})^2 + \mathrm{e}^{-t}}}, y(t) = \frac{1}{1 + \mathrm{e}^{-t}}\right\} \tag{14}$$

> $sol2 := dsolve\left(\left\{eq1, eq2, x(0) = 1, y(0) = \frac{1}{2}\right\}, \{x(t), y(t)\}\right)$

(15)

$$sol2 := \left\{ x(t) = \frac{1}{\sqrt{\left(1+e^{-t}\right)e^{-t}}\left(\frac{2\sqrt{\left(e^{-t}\right)^2+e^{-t}}}{e^{-t}} - \frac{3\sqrt{2}}{2}\right)}, y(t) = \frac{1}{1+e^{-t}} \right\} \quad (15)$$

```
> x1_sol := rhs(sol1[1]);
```

$$x1\_sol := \frac{e^{-t}}{2\sqrt{\left(1+e^{-t}\right)e^{-t}}\sqrt{\left(e^{-t}\right)^2+e^{-t}}} \quad (16)$$

```
> y1_sol := rhs(sol1[2]);
```

$$y1\_sol := \frac{1}{1+e^{-t}} \quad (17)$$

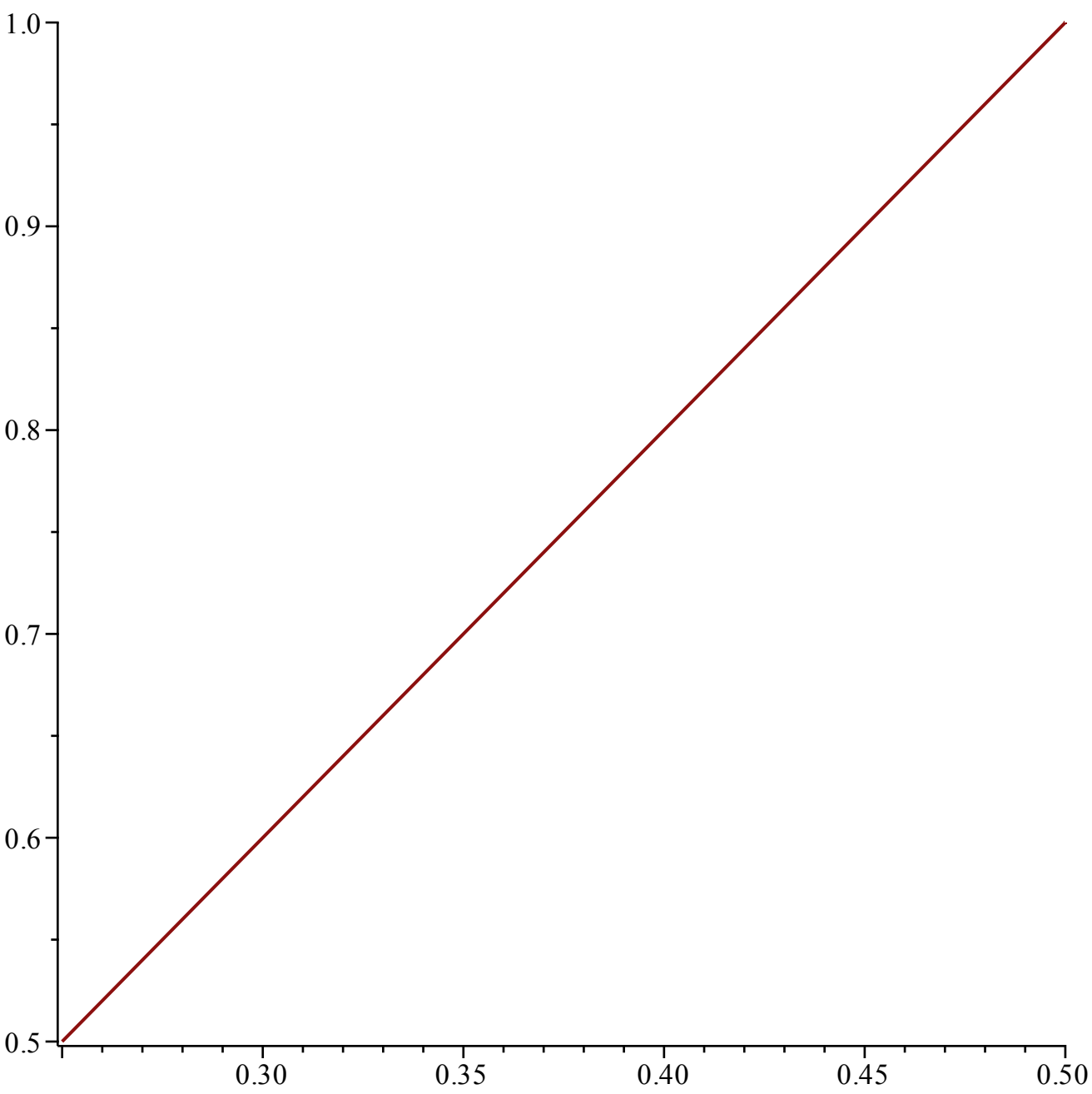
```
> x2_sol := rhs(sol2[1]);
```

$$x2\_sol := \frac{1}{\sqrt{\left(1+e^{-t}\right)e^{-t}}\left(\frac{2\sqrt{\left(e^{-t}\right)^2+e^{-t}}}{e^{-t}} - \frac{3\sqrt{2}}{2}\right)} \quad (18)$$

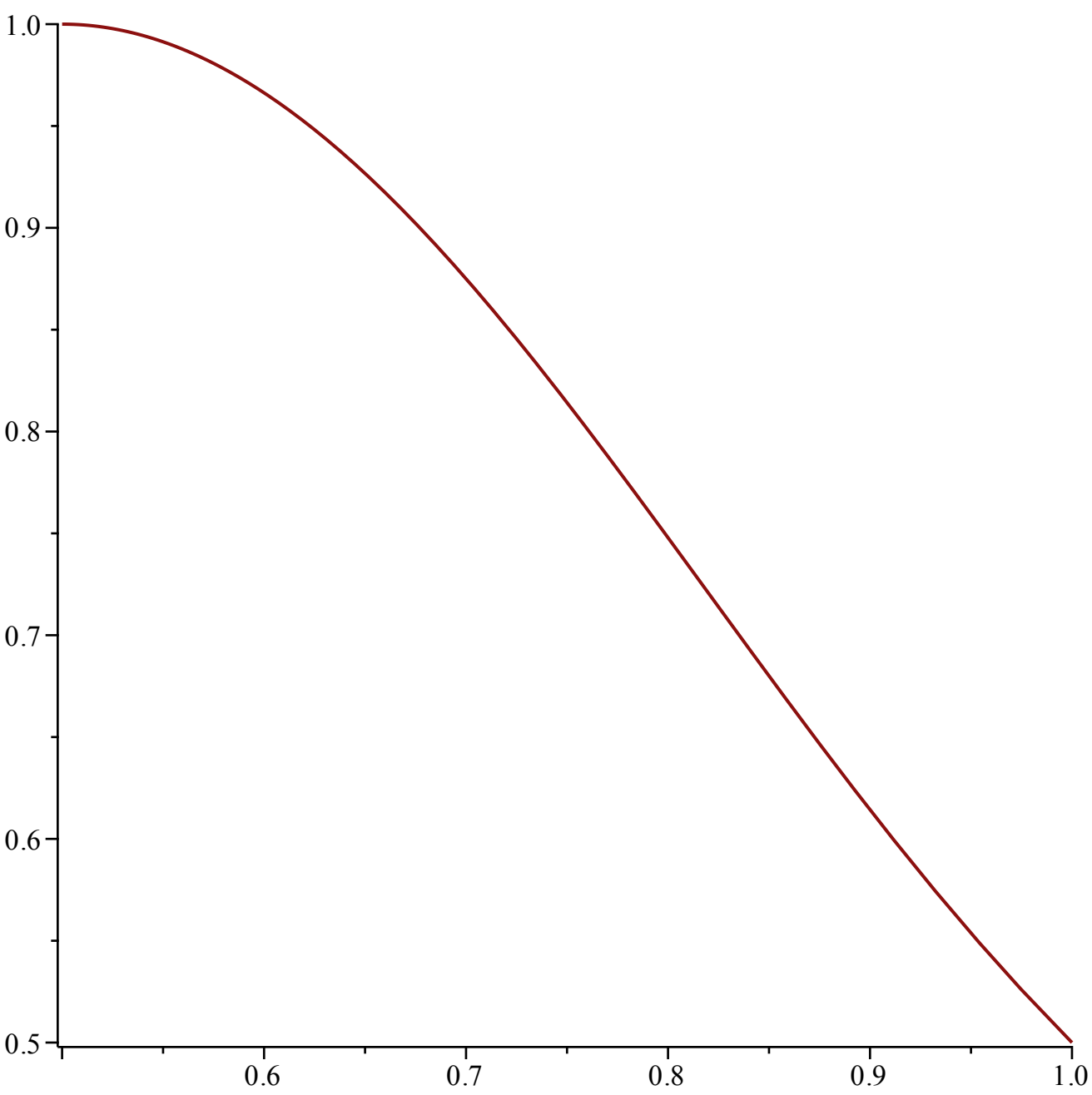
```
> y2_sol := rhs(sol2[2]);
```

$$y2\_sol := \frac{1}{1+e^{-t}} \quad (19)$$

```
> plot([x1_sol, y1_sol, t = 0..20])
```




```
> plot([x2_sol, y2_sol, t = 0 ..20])
```



> $eeq1 := x \cdot \left(1 - x - \frac{1}{2} \cdot y\right) = 0;$

$$eeq1 := x\left(1 - x - \frac{y}{2}\right) = 0 \quad \textbf{(20)}$$

> $eeq2 := y \cdot (1 - y) = 0;$

$$eeq2 := y\,(1 - y) = 0 \quad \textbf{(21)}$$

> $equilibira := solve(\{eeq1, eeq2\}, \{x, y\});$

$$equilibira := \{x = 0, y = 0\}, \{x = 1, y = 0\}, \{x = 0, y = 1\}, \left\{x = \frac{1}{2}, y = 1\right\} \quad \textbf{(22)}$$

>