

restart

Example 1: convert

$$eq := \frac{\exp(x)}{\exp(2x) + a} - b \operatorname{sech}\left(x + \frac{1}{2} \ln\left(\frac{1}{a}\right)\right);$$

$$bb := \operatorname{solve}(eq, b);$$

$$\frac{e^x}{\operatorname{sech}\left(x + \frac{1}{2} \ln\left(\frac{1}{a}\right)\right) (e^{2x} + a)} \quad (1)$$

$$bb := \operatorname{convert}(bb, \exp)$$

$$\frac{1}{2 \sqrt{\frac{1}{a} - a}} \quad (2)$$

$$eq2 := \operatorname{simplify}(\operatorname{subs}(b = bb, eq))$$

$$\frac{\frac{1}{2} \frac{2 e^x \sqrt{\frac{1}{a} - a} \cosh\left(x + \frac{1}{2} \ln\left(\frac{1}{a}\right)\right) - e^{2x} - a}{\cosh\left(x + \frac{1}{2} \ln\left(\frac{1}{a}\right)\right) (e^{2x} + a) \sqrt{\frac{1}{a} - a}}}{1} \quad (3)$$

$$[\operatorname{convert}(eq2, \exp), 1]$$

$$[0, 1] \quad (4)$$

$$\operatorname{convert}([a, b, c, d, e], \text{'+'})$$

$$a + b + c + d + e \quad (5)$$

Example 2: evalc

$$eq := \exp(3 + 4 I) + \sinh(x + 4 t + I);$$

$$e^{3+4 I} + \sinh(x + 4 t + I) \quad (6)$$

$$\operatorname{Re}(eq), \operatorname{Im}(eq)$$

$$e^3 \cos(4) + \Re(\sinh(x + 4 t + I)), e^3 \sin(4) + \Im(\sinh(x + 4 t + I)) \quad (7)$$

$$\operatorname{assume}('x', \operatorname{real}), \operatorname{assume}('t', \operatorname{real});$$

$$eq$$

$$e^{3+4 I} + \sinh(\tilde{x} + 4 \tilde{t} + I) \quad (8)$$

$$\operatorname{Re}(eq), \operatorname{Im}(eq)$$

$$e^3 \cos(4) + \sinh(\tilde{x} + 4 \tilde{t}) \cos(1), e^3 \sin(4) + \cosh(\tilde{x} + 4 \tilde{t}) \sin(1) \quad (9)$$

$$\operatorname{unassign}('x', 't');$$

$$eq \quad e^{3+4I} + \sinh(x+4t+I) \quad (10)$$

$$eq2 := evalc(eq) \quad e^3 \cos(4) + \sinh(x+4t) \cos(1) + I (e^3 \sin(4) + \cosh(x+4t) \sin(1)) \quad (11)$$

$$remove(has, eq2, I) \quad e^3 \cos(4) + \sinh(x+4t) \cos(1) \quad (12)$$

$$(-I) select(has, eq2, I) \quad e^3 \sin(4) + \cosh(x+4t) \sin(1) \quad (13)$$

Example 3: map

with(LinearAlgebra) :

k := 2 :

M := convert([seq(seq(cat(v, i, j), i = 1..k), j = 1..k)], Matrix, k, k);

M := map(e → e(x), M);

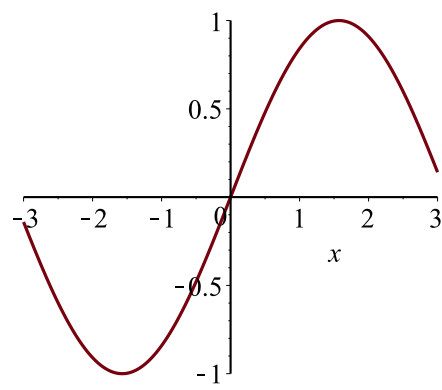
$$\begin{bmatrix} v11 & v21 \\ v12 & v22 \end{bmatrix} \quad \begin{bmatrix} v11(x) & v21(x) \\ v12(x) & v22(x) \end{bmatrix} \quad (14)$$

map(diff, M, x)

$$\begin{bmatrix} \frac{d}{dx} v11(x) & \frac{d}{dx} v21(x) \\ \frac{d}{dx} v12(x) & \frac{d}{dx} v22(x) \end{bmatrix} \quad (15)$$

Example 4: plot

plot(sin(x), x = -3..3)



$\text{plot3d}\left(\text{sech}^2\left(\frac{x}{6} + t\right), \ x=-3..3, \ t=-3..3 \right)$

