

```
> restart;with(DEtools):with(linalg):with(plots):
```

An example of using Maple to find solutions to IVP for a given ODE (Text, problem 4.6.25).

Consider the ODE (linear, homogeneous, constant coefficients):

```
> de1 := D(D(y))(x) - 2*D(y)(x) + 2*y(x) = 0;
```

$$de1 := (D^{(2)}(y)(x) - 2 D(y)(x) + 2 y(x) = 0$$

The initial conditions are

```
> init_con := y(Pi) = exp(Pi), D(y)(Pi) = 0;
```

$$init_con := y(\pi) = e^\pi, D(y)(\pi) = 0$$

We now compute the solution using DSOLVE:

```
> solution := dsolve({de1, init_con},{y(x)});
```

$$solution := y(x) = e^x \sin(x) - e^x \cos(x)$$

Now some MAPLE esoterica: convert the FUNCTION $y(x)$ to an EXPRESSION that can be evaluated and plotted;

this is done with the command subs:

```
> expr := subs(solution,y(x));
```

$$expr := e^x \sin(x) - e^x \cos(x)$$

```
> plot(expr,x=0..5, axes=BOXED,title="solution to a 2nd order IVP");
```

