```
> restart;
```

- Load from http://www.ccas.ru/ca/_media/truncatedseries2020.zip the archive with two files: maple.ind and maple.lib.
- Put these files to some directory, for example to "/usr/userlib".
- Assign libname := "/usr/userlib", libname in the Maple session.

```
> libname := "maple.lib", libname :
> with(TruncatedSeries);
```

$$[FormalSolution, LaurentSolution, RegularSolution] \tag{1}$$

```
>
> eq1 := O(x^5) \frac{d^4}{dx^4} y(x) + (x^4 + O(x^5)) \frac{d^3}{dx^3} y(x) + O(x^3) \frac{d^2}{dx^2} y(x) + (x + O(x^2)) \frac{d}{dx} y(x) + (1 + O(x^2)) y(x) :
  FormalSolution(eq1, y(x));
```

$$\left[\frac{\_c_1 + O(x)}{x} + y_{irr,1}(x) + y_{irr,2}(x) \right] \tag{2}$$

```
> eq2 := (x^4 + O(x^5)) \frac{d^3}{dx^3} y(x) + O(x^3) \frac{d^2}{dx^2} y(x) + (x + O(x^2)) \frac{d}{dx} y(x) + (1 + O(x^2)) y(x) = 0 :
> FormalSolution(eq2, y(x));
```

$$\left[\frac{\_c_1 + O(x)}{x} + e^{-\frac{2\,RootOf(\_Z^2 + 1,\, index = 1)}{\sqrt{x}}} y_{reg,1}(\sqrt{x}) + e^{-\frac{2\,RootOf(\_Z^2 + 1,\, index = 2)}{\sqrt{x}}} y_{reg,2}(\sqrt{x}) \right] \tag{3}$$

```
>
> eq3 := (x^8 + O(x^9)) \frac{d^3}{dx^3} z(x) + O(x^5) \frac{d^2}{dx^2} z(x) + (3x^2 + O(x^3)) \frac{d}{dx} z(x) + (2 + O(x^2)) z(x) = 0 :
> FormalSolution(eq3, z(x));
```

$$\left[e^{\frac{2}{3x}} z_{reg}(x) + z_{irr(2),1}(x) + z_{irr(2),2}(x) \right] \tag{4}$$

```
>
> eq4 := (-64x^6 + 240x^7 + O(x^8)) \frac{d^4}{dx^4} y(x) + (-512x^5 + 1680x^6 + O(x^7)) \frac{d^3}{dx^3} y(x) + (32x^3 - 888x^4
  + 1980x^5 + O(x^6)) \frac{d^2}{dx^2} y(x) + (32x^2 + 60x^3 - 180x^4 + O(x^5)) \frac{d}{dx} y(x) + (-4 + 43x - 150x^2
  + 180x^3 + O(x^4)) y(x) = 0 :
> FormalSolution(eq4, y(x));
```

$$\left[e^{-\frac{1}{\sqrt{x}}} \left(x \left(\_c_1 + O(x) \right) + y_{reg,1}(\sqrt{x}) \right) + e^{\frac{1}{\sqrt{x}}} \left(x \left(\_c_2 + O(x) \right) + y_{reg,2}(\sqrt{x}) \right) \right] \tag{5}$$

```
>
> eq5 := (x^6 + O(x^7)) \frac{d^3}{dx^3} y(x) + (x^4 + O(x^5)) \frac{d^2}{dx^2} y(x) + O(x^2) \frac{d}{dx} y(x) + (x + O(x^2)) y(x) = 0 :
> FormalSolution(eq5, y(x));
```

$$[y_1(x) + y_{irr}(x) + y_{irr(1)}(x)] \tag{6}$$

```
>
```