```
> restart
>
```

$$\underbrace{\left(5x^3y^2+4x^2y^3+2y\right)}_{MM}+\underbrace{\left(4x^4y+5x^3y^2+3x\right)}_{NN}\frac{dy}{dx}=0$$

```
> Ecuacion := 5·x··3·y(x)··2 + 4·x··2·y(x)··3 + 2·y(x) + (4·x··4·y(x) + 5·x··3·y(x)··2
      + 3·x)·diff(y(x), x) = 0
```

$$Ecuacion := 5x^3y(x)^2+4x^2y(x)^3+2y(x)+\left(4x^4y(x)+5x^3y(x)^2+3x\right)\left(\frac{d}{dx}y(x)\right)=0 \quad (1)$$

```
> with(DEtools) :
> odeadvisor(Ecuacion)
```

$$[\_rational] \quad (2)$$

```
> simplify(intfactor(Ecuacion))
```

$$\frac{1}{x\left(x^2y(x)^2+1+x^3y(x)\right)y(x)} \quad (3)$$

```
> FactInt := 1/(x·(x^2·y^2 + 1 + x^3·y)·y)
```

$$FactInt := \frac{1}{x\,y\left(x^2y^2+1+x^3y\right)} \quad (4)$$

```
> M := 5·x^3·y^2 + 4·x^2·y^3 + 2·y
```

$$M := 5x^3y^2+4x^2y^3+2y \quad (5)$$

```
> N := (4·x··4·y + 5·x··3·y··2 + 3·x)
```

$$N := 4x^4y+5x^3y^2+3x \quad (6)$$

```
> Comprobacion_1 := simplify(diff(M, y) - diff(N, x)) = 0
```

$$Comprobacion_1 := -6x^3y-3x^2y^2-1=0 \quad (7)$$

```
> MM := simplify(FactInt·M)
```

$$MM := \frac{5x^3y+4x^2y^2+2}{x\left(x^2y^2+1+x^3y\right)} \quad (8)$$

```
> NN := simplify(FactInt·N)
```

$$NN := \frac{4x^3y+5x^2y^2+3}{y\left(x^2y^2+1+x^3y\right)} \quad (9)$$

```
> Comprobacion_2 := simplify(diff(MM, y) - diff(NN, x)) = 0
```

$$Comprobacion_2 := 0=0 \quad (10)$$

```
> FaIn := x·y··2
```

$$FaIn := xy^2 \quad (11)$$

```
> MMM := simplify(M·FaIn)
```

$$MMM := y^3\left(5x^3y+4x^2y^2+2\right)x \quad (12)$$

```
> NNN := simplify(N·FaIn)
```

$$NNN := y^2\left(4x^3y+5x^2y^2+3\right)x^2 \quad (13)$$

> $Comprobacion_3 := simplify(diff(MMM, y) - diff(NNN, x)) = 0$

$$Comprobacion_3 := 0 = 0 \quad \textbf{(14)}$$

> $SG_1 := simplify(int(MMM, x) + int((NNN - diff(int(MMM, x), y)), y)) = C_1$

$$SG_1 := x^5 y^4 + x^4 y^5 + x^2 y^3 = C_1 \quad \textbf{(15)}$$

> $SG_2 := simplify(int(MM, x) + int((NN - diff(int(MM, x), y)), y)) = C_1$

$$SG_2 := 2\ln(x) + \ln(x^2 y^2 + 1 + x^3 y) + 3\ln(y) = C_1 \quad \textbf{(16)}$$

> $expand(simplify(\exp(lhs(SG_2))))) = C_1$

$$x^5 y^4 + x^4 y^5 + x^2 y^3 = C_1 \quad \textbf{(17)}$$

>

>

>