```
> restart
> Ecua := (2·x + 3·x^2·y(x)^2 + 12·x·y(x)^3) + (2·x^3·y(x) + 18·x^2·y(x)^2 − 15·y(x)^2)·diff(y(x), x) = 0
```

$$Ecua := 2x + 3x^2 y(x)^2 + 12x y(x)^3 + \left(2x^3 y(x) + 18x^2 y(x)^2 - 15 y(x)^2\right)\left(\frac{d}{dx} y(x)\right) = 0 \quad (1)$$

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

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

```
> M := 2x + 3x^2 y^2 + 12x y^3
```

$$M := 3x^2 y^2 + 12x y^3 + 2x \quad (3)$$

```
> N := 2x^3 y + 18x^2 y^2 − 15y^2
```

$$N := 2x^3 y + 18x^2 y^2 - 15y^2 \quad (4)$$

```
> Comprobar := diff(M, y) − diff(N, x) = 0
```

$$Comprobar := 0 = 0 \quad (5)$$

```
> IMx := int(M, x)
```

$$IMx := x^3 y^2 + 6x^2 y^3 + x^2 \quad (6)$$

```
> SolucionGeneral := IMx + int((N − diff(IMx, y)), y) = _C1
```

$$SolucionGeneral := x^3 y^2 + 6x^2 y^3 - 5y^3 + x^2 = \_C1 \quad (7)$$

```
> INy := int(N, y)
```

$$INy := x^3 y^2 + 6x^2 y^3 - 5y^3 \quad (8)$$

```
> SolGral := INy + int((M − diff(INy, x)), x) = _C1
```

$$SolGral := x^3 y^2 + 6x^2 y^3 - 5y^3 + x^2 = \_C1 \quad (9)$$

```
> restart
> Ecua := x/sqrt(x^2 + y(x)^2) + 1/x + 1/y(x) + (y(x)/sqrt(x^2 + y(x)^2) + 1/y(x) − x/y(x)^2)·diff(y(x), x) = 0
```

$$Ecua := \frac{x}{\sqrt{x^2 + y(x)^2}} + \frac{1}{x} + \frac{1}{y(x)} + \left(\frac{y(x)}{\sqrt{x^2 + y(x)^2}} + \frac{1}{y(x)} - \frac{x}{y(x)^2}\right)\left(\frac{d}{dx} y(x)\right) = 0 \quad (10)$$

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

$$[\_exact] \quad (11)$$

```
> M := x/sqrt(x^2 + y^2) + 1/x + 1/y
```

$$M := \frac{x}{\sqrt{x^2 + y^2}} + \frac{1}{x} + \frac{1}{y} \quad (12)$$

```
> N := y/sqrt(x^2 + y^2) + 1/y − x/y^2
```

$$N := \frac{y}{\sqrt{x^2 + y^2}} + \frac{1}{y} - \frac{x}{y^2} \quad (13)$$

```
> IMx := int(M, x)
```

$$IMx := \sqrt{x^2+y^2} + \ln(x) + \frac{x}{y} \tag{14}$$

> $SolucionGeneral := IMx + int((N - diff(IMx, y)), y) = \_C1$

$$SolucionGeneral := \sqrt{x^2+y^2} + \ln(x) + \frac{x}{y} + \ln(y) = \_C1 \tag{15}$$

> $restart$

> $Ecuacion := 2\cdot y + 3\cdot x\cdot y^2 + 4\cdot x^2\cdot y^3 + (x + 2\cdot x^2\cdot y + 3\cdot x^3\cdot y^2)\cdot y' = 0$

$$Ecuacion := 2\,y(x) + 3\,x\,y(x)^2 + 4\,x^2\,y(x)^3 + (x + 2\,x^2\,y(x) + 3\,x^3\,y(x)^2)\left(\frac{d}{dx}\,y(x)\right) = 0 \tag{16}$$

> $with(DEtools)$:

> $odeadvisor(Ecuacion)$

$$[[\_homogeneous, class\ G], \_rational] \tag{17}$$

> $FI := intfactor(Ecuacion)$

$$FI := x \tag{18}$$

> $Ecua := expand(FI\cdot(Ecuacion))$

$$Ecua := 2\,x\,y(x) + 3\,x^2\,y(x)^2 + 4\,x^3\,y(x)^3 + \left(\frac{d}{dx}\,y(x)\right)x^2 + 2\left(\frac{d}{dx}\,y(x)\right)x^3\,y(x) + 3\left(\frac{d}{dx}\,y(x)\right)x^4\,y(x)^2 = 0 \tag{19}$$

> $odeadvisor(Ecua)$

$$[[\_homogeneous, class\ G], \_exact, \_rational] \tag{20}$$

> $M := 2\,x\,y + 3\,x^2\,y^2 + 4\,x^3\,y^3$

$$M := 4\,x^3\,y^3 + 3\,x^2\,y^2 + 2\,x\,y \tag{21}$$

> $N := x^2 + 2\,x^3\,y + 3\,x^4\,y^2$

$$N := 3\,x^4\,y^2 + 2\,x^3\,y + x^2 \tag{22}$$

> $Imx := int(M, x)$

$$Imx := x^4\,y^3 + x^3\,y^2 + x^2\,y \tag{23}$$

> $SolGral := Imx + int((N - diff(Imx, y)), y) = \_C1$

$$SolGral := x^4\,y^3 + x^3\,y^2 + x^2\,y = \_C1 \tag{24}$$

>