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

$$Ecuacion := 2\,x\,y(x)^3 + 2\,x\,y(x)^4 + 3\,x^2\,y(x)^2 + \left(3\,x^2\,y(x)^2 + 4\,x^2\,y(x)^3 \right. \tag{1}$$
$$\left. + 2\,x^3\,y(x)\right)\left(\frac{\mathrm{d}}{\mathrm{d}x}\,y(x)\right) = 0$$

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

$$[\_exact, \_rational, \_dAlembert] \tag{2}$$

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

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

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

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

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

$$Comprobacion := 0 = 0 \tag{5}$$

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

$$IntMx := x^2\,y^3 + y^4\,x^2 + y^2\,x^3 \tag{6}$$

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

$$IntNy := x^2\,y^3 + y^4\,x^2 + y^2\,x^3 \tag{7}$$

```
> SG1 := IntMx + int((N − diff(IntMx, y)), y) = C_1
```

$$SG1 := x^2\,y^3 + y^4\,x^2 + y^2\,x^3 = C_1 \tag{8}$$

```
> SG2 :=  IntNy + int((M − diff(IntNy, x)), x) = C_1
```

$$SG2 := x^2\,y^3 + y^4\,x^2 + y^2\,x^3 = C_1 \tag{9}$$

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

$$EcuacionDos := 2\,y(x)^3 + 2\,y(x)^4 + 3\,x\,y(x)^2 + \left(3\,x\,y(x)^2 + 4\,x\,y(x)^3 \right. \tag{10}$$
$$\left. + 2\,x^2\,y(x)\right)\left(\frac{\mathrm{d}}{\mathrm{d}x}\,y(x)\right) = 0$$

```
> odeadvisor(EcuacionDos)
```

$$[\_rational, \_dAlembert] \tag{11}$$

```
> FactorIntegrante := intfactor(EcuacionDos)
```

$$FactorIntegrante := x \tag{12}$$

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

$$EcuacionTres := 2\,x\,y(x)^2 + 2\,x\,y(x)^3 + 3\,x^2\,y(x) + \left(3\,x^2\,y(x) + 4\,x^2\,y(x)^2 \right. \tag{13}$$
$$\left. + 2\,x^3\right)\left(\frac{\mathrm{d}}{\mathrm{d}x}\,y(x)\right) = 0$$

```
> odeadvisor(EcuacionTres)
```

$$[\_rational] \tag{14}$$

```
> simplify(intfactor(EcuacionTres))
```

$$y(x) \tag{15}$$

> $FactorTres := y$

$$FactorTres := y \tag{16}$$

>