```
> restart
> Ecua := (2·x·y^5 + 24·x^2·y^4 − 24·x^3·y^3 + 50·x^4·y^2) + (5·x^2·y^4 + 32·x^3·y^3 − 18·x^4·y^2 + 20·x^5
      ·y)·y' = 0
```

$$Ecua := 2\,x\,y(x)^5 + 24\,x^2\,y(x)^4 - 24\,x^3\,y(x)^3 + 50\,x^4\,y(x)^2 + \left(5\,x^2\,y(x)^4 + 32\,x^3\,y(x)^3 - 18\,x^4\,y(x)^2 + 20\,x^5\,y(x)\right)\left(\frac{d}{dx}\,y(x)\right) = 0 \quad (1)$$

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

$$[[\_homogeneous, class\ A], \_exact, \_rational, \_dAlembert] \quad (2)$$

```
> M := 2 x y^5 + 24 x^2 y^4 − 24 x^3 y^3 + 50 x^4 y^2
```

$$M := 50\,x^4\,y^2 - 24\,x^3\,y^3 + 24\,x^2\,y^4 + 2\,x\,y^5 \quad (3)$$

```
> N := (5·x^2·y^4 + 32·x^3·y^3 − 18·x^4·y^2 + 20·x^5·y)
```

$$N := 20\,x^5\,y - 18\,x^4\,y^2 + 32\,x^3\,y^3 + 5\,x^2\,y^4 \quad (4)$$

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

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

```
> SGuno := expand(IntMx + int((N − diff(IntMx, y)), y)) = _C1
```

$$SGuno := 10\,y^2\,x^5 - 6\,y^3\,x^4 + 8\,y^4\,x^3 + y^5\,x^2 = \_C1 \quad (6)$$

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

$$IntNy := x^2\left(10\,y^2\,x^3 - 6\,y^3\,x^2 + 8\,y^4\,x + y^5\right) \quad (7)$$

```
> SGdos := expand(IntNy + int((M − diff(IntNy, x)), x)) = _C1
```

$$SGdos := 10\,y^2\,x^5 - 6\,y^3\,x^4 + 8\,y^4\,x^3 + y^5\,x^2 = \_C1 \quad (8)$$

```
> SGtres := dsolve(Ecua)
```

$$SGtres := y(x) = 0,\ 10\,y(x)^2\,x^5 - 6\,y(x)^3\,x^4 + 8\,y(x)^4\,x^3 + y(x)^5\,x^2 + c_1 = 0 \quad (9)$$

```
> Ecua
```

$$2\,x\,y(x)^5 + 24\,x^2\,y(x)^4 - 24\,x^3\,y(x)^3 + 50\,x^4\,y(x)^2 + \left(5\,x^2\,y(x)^4 + 32\,x^3\,y(x)^3 - 18\,x^4\,y(x)^2 + 20\,x^5\,y(x)\right)\left(\frac{d}{dx}\,y(x)\right) = 0 \quad (10)$$

```
> SolFinalUno := 10 y(x)^2 x^5 − 6 y(x)^3 x^4 + 8 y(x)^4 x^3 + y(x)^5 x^2 = _C1
```

$$SolFinalUno := 10\,y(x)^2\,x^5 - 6\,y(x)^3\,x^4 + 8\,y(x)^4\,x^3 + y(x)^5\,x^2 = c_1 \quad (11)$$

```
> DerSolFinal := isolate(diff(SolFinalUno, x), diff(y(x), x))
```

$$DerSolFinal := \frac{d}{dx}\,y(x) = \frac{-2\,x\,y(x)^5 - 24\,x^2\,y(x)^4 + 24\,x^3\,y(x)^3 - 50\,x^4\,y(x)^2}{5\,x^2\,y(x)^4 + 32\,x^3\,y(x)^3 - 18\,x^4\,y(x)^2 + 20\,x^5\,y(x)} \quad (12)$$

```
> DerEcua := isolate(Ecua, diff(y(x), x))
```

$$DerEcua := \frac{d}{dx}\,y(x) = \frac{-2\,x\,y(x)^5 - 24\,x^2\,y(x)^4 + 24\,x^3\,y(x)^3 - 50\,x^4\,y(x)^2}{5\,x^2\,y(x)^4 + 32\,x^3\,y(x)^3 - 18\,x^4\,y(x)^2 + 20\,x^5\,y(x)} \quad (13)$$

```
> Comprobar := simplify(rhs(DerSolFinal) − rhs(DerEcua) = 0)
```

$$Comprobar := 0 = 0 \quad (14)$$

```
> restart
> EcuaDos := (2·y^5 + 24·x·y^4 − 24·x^2·y^3 + 50·x^3·y^2) + (5·x·y^4 + 32·x^2·y^3 − 18·x^3·y^2 + 20·x^4
      ·y)·y' = 0
```

$$EcuaDos := 2\,y(x)^5 + 24\,x\,y(x)^4 - 24\,x^2\,y(x)^3 + 50\,x^3\,y(x)^2 + \left(5\,x\,y(x)^4 + 32\,x^2\,y(x)^3 - 18\,x^3\,y(x)^2 + 20\,x^4\,y(x)\right)\left(\frac{d}{dx}\,y(x)\right) = 0 \quad (15)$$

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

$$[[\_homogeneous, class\ A], \_rational, \_dAlembert] \quad (16)$$

```
> FactInt := intfactor(EcuaDos)
```

$$FactInt := x \quad (17)$$

```
> EcuaTres := simplify(FactInt·EcuaDos)
```

$$EcuaTres := \left(20\,x^5\,y(x) - 18\,x^4\,y(x)^2 + 32\,x^3\,y(x)^3 + 5\,x^2\,y(x)^4\right)\left(\frac{d}{dx}\,y(x)\right) + 50\,x^4\,y(x)^2 - 24\,x^3\,y(x)^3 + 24\,x^2\,y(x)^4 + 2\,x\,y(x)^5 = 0 \quad (18)$$

```
> odeadvisor(EcuaTres)
```

$$[[\_homogeneous, class\ A], \_exact, \_rational, \_dAlembert] \quad (19)$$

```
> restart
> EcuaCuatro := (2·x·y^4 + 24·x^2·y^3 − 24·x^3·y^2 + 50·x^4·y) + (5·x^2·y^3 + 32·x^3·y^2 − 18·x^4·y
      + 20·x^5)·y' = 0
```

$$EcuaCuatro := 2\,x\,y(x)^4 + 24\,x^2\,y(x)^3 - 24\,x^3\,y(x)^2 + 50\,x^4\,y(x) + \left(5\,x^2\,y(x)^3 + 32\,x^3\,y(x)^2 - 18\,x^4\,y(x) + 20\,x^5\right)\left(\frac{d}{dx}\,y(x)\right) = 0 \quad (20)$$

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

$$[[\_homogeneous, class\ A], \_rational, \_dAlembert] \quad (21)$$

```
> intfactor(EcuaCuatro)
```

$$y(x) \quad (22)$$

```
> FactIntCuatro := y
```

$$FactIntCuatro := y \quad (23)$$

```
>
```