

```
> restart
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$$Ecua := \text{diff}(y(x), x) = \frac{y(x)}{x}$$

$$Ecua := \frac{d}{dx} y(x) = \frac{y(x)}{x}$$

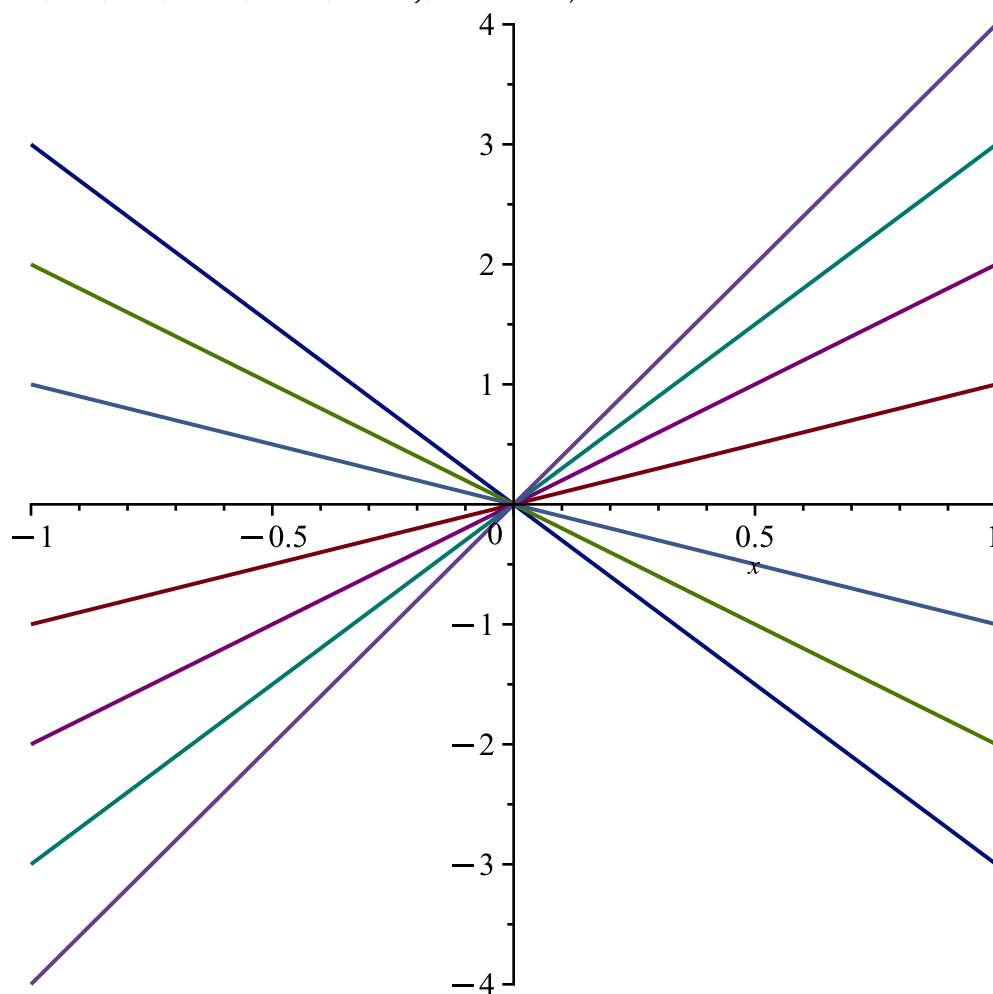
(1)

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> Sol := dsolve(Ecua)
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$$Sol := y(x) = c_1 x$$

(2)

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> plot( {x, 2·x, 3·x, 4·x, -1·x, -2·x, -3·x}, x=-1..1)
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> with(DEtools):
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> odeadvisor(Ecua)
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$$[_separable]$$

(3)

```
> restart
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$$Ecua := (y^2 + x \cdot y^2) \cdot y' + (x^2 - y \cdot x^2) = 0$$

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

(4)

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

$$[_separable]$$

(5)

$$\begin{aligned}
& \text{> } M := x^2 - y \cdot x^2 & M := -y x^2 + x^2 & (6) \\
& \text{> } N := y^2 + x \cdot y^2 & N := x y^2 + y^2 & (7) \\
& \text{> } FactM := factor(M) & FactM := -x^2 (y - 1) & (8) \\
& \text{> } FactaN := factor(N) & FactaN := y^2 (x + 1) & (9) \\
& \text{> } P := -x^2; Q := y - 1; R := x + 1; S := y^2 & P := -x^2 & \\
& & Q := y - 1 & \\
& & R := x + 1 & \\
& & S := y^2 & (10) \\
& \text{> } SolGral := \int \left(\frac{P}{R}, x \right) + \int \left(\frac{S}{Q}, y \right) = _CI & \\
& & SolGral := -\frac{x^2}{2} + x - \ln(x + 1) + \frac{y^2}{2} + y + \ln(y - 1) = _CI & (11) \\
& \text{> } SolGralFinal := -\frac{x^2}{2} + x - \ln(x + 1) + \frac{y(x)^2}{2} + y(x) + \ln(y(x) - 1) = _CI & \\
& & SolGralFinal := -\frac{x^2}{2} + x - \ln(x + 1) + \frac{y(x)^2}{2} + y(x) + \ln(y(x) - 1) = _CI & (12) \\
& \text{> } DerSolGral := simplify(isolate(diff(SolGralFinal, x), diff(y(x), x))) & \\
& & DerSolGral := \frac{d}{dx} y(x) = \frac{x^2 (y(x) - 1)}{(x + 1) y(x)^2} & (13) \\
& \text{> } DerEcua := isolate(Ecua, diff(y(x), x)) & \\
& & DerEcua := \frac{d}{dx} y(x) = \frac{-x^2 + y(x) x^2}{y(x)^2 + x y(x)^2} & (14) \\
& \text{> } Comprobar := simplify((rhs(DerSolGral) - rhs(DerEcua))) = 0 & \\
& & Comprobar := 0 = 0 & (15) \\
& \text{> } dsolve(Ecua) & \\
& & y(x) = e^{\text{RootOf}(-e^2 Z + x^2 - 4 e^Z + 2 \ln(x + 1) + 2 c_1 - 2 Z - 2 x - 3)} + 1 & (16) \\
& \text{> } restart & \\
& \text{> } Ecua := \exp(y) \cdot (1 + x^2) \cdot y' - 2 \cdot x \cdot (1 + \exp(y)) = 0 & \\
& & Ecua := e^{y(x)} (x^2 + 1) \left(\frac{d}{dx} y(x) \right) - 2 x (1 + e^{y(x)}) = 0 & (17) \\
& \text{> } with(DEtools): & \\
& \text{> } odeadvisor(Ecua) & \\
& & [_separable] & (18)
\end{aligned}$$

$$\begin{aligned} > M := -2x(1 + e^y) \\ & \qquad \qquad \qquad M := -2x(1 + e^y) \end{aligned} \tag{19}$$

$$\begin{aligned} > N := e^y(x^2 + 1) \\ & \qquad \qquad \qquad N := e^y(x^2 + 1) \end{aligned} \tag{20}$$

$$\begin{aligned} > P := -2 \cdot x; Q := 1 + \exp(y); R := (x^2 + 1); S := e^y \\ & \qquad \qquad \qquad P := -2x \\ & \qquad \qquad \qquad Q := 1 + e^y \\ & \qquad \qquad \qquad R := x^2 + 1 \\ & \qquad \qquad \qquad S := e^y \end{aligned} \tag{21}$$

$$\begin{aligned} > SolGral := \int \left(\frac{P}{R}, x \right) + \int \left(\frac{S}{Q}, y \right) = _CI \\ & \qquad \qquad \qquad SolGral := -\ln(x^2 + 1) + \ln(1 + e^y) = _CI \end{aligned} \tag{22}$$

$$\begin{aligned} > SolGralDos := \text{simplify}(\exp(\text{lhs}(SolGral))) = _CI \\ & \qquad \qquad \qquad SolGralDos := \frac{1 + e^y}{x^2 + 1} = _CI \end{aligned} \tag{23}$$

$$\begin{aligned} > SolGralFinal := \frac{1 + e^{y(x)}}{x^2 + 1} = _CI \\ & \qquad \qquad \qquad SolGralFinal := \frac{1 + e^{y(x)}}{x^2 + 1} = _CI \end{aligned} \tag{24}$$

$$\begin{aligned} > DerSolGral := \text{isolate}(\text{diff}(SolGralFinal, x), \text{diff}(y(x), x)) \\ & \qquad \qquad \qquad DerSolGral := \frac{d}{dx} y(x) = \frac{2x(1 + e^{y(x)})}{e^{y(x)}(x^2 + 1)} \end{aligned} \tag{25}$$

$$\begin{aligned} > DerEcua := \text{isolate}(Ecua, \text{diff}(y(x), x)) \\ & \qquad \qquad \qquad DerEcua := \frac{d}{dx} y(x) = \frac{2x(1 + e^{y(x)})}{e^{y(x)}(x^2 + 1)} \end{aligned} \tag{26}$$

$$\begin{aligned} > Comprobar := \text{rhs}(DerEcua) - \text{rhs}(DerSolGral) = 0 \\ & \qquad \qquad \qquad Comprobar := 0 = 0 \end{aligned} \tag{27}$$

> restart

>