> *restart*

> $EcuacionDiferencial := y' = \dfrac{y}{x}$

$$EcuacionDiferencial := \frac{d}{dx}\, y(x) = \frac{y(x)}{x} \tag{1}$$

> $SolucionGeneral := dsolve(EcuacionDiferencial)$

$$SolucionGeneral := y(x) = \_C1\, x \tag{2}$$

> $?scaling$

> $plot\Big(\Big\{subs(\_C1 = 1, rhs(SolucionGeneral)), subs(\_C1 = -1, rhs(SolucionGeneral)), subs\Big(\_C1$
$= \dfrac{1}{2}, rhs(SolucionGeneral)\Big), subs\Big(\_C1 = -\dfrac{1}{2}, rhs(SolucionGeneral)\Big), subs(\_C1 = 2,$
$rhs(SolucionGeneral)), subs(\_C1 = -2, rhs(SolucionGeneral))\Big\}, x = -10..10, y = -10..10,$
$scaling = constrained\Big)$
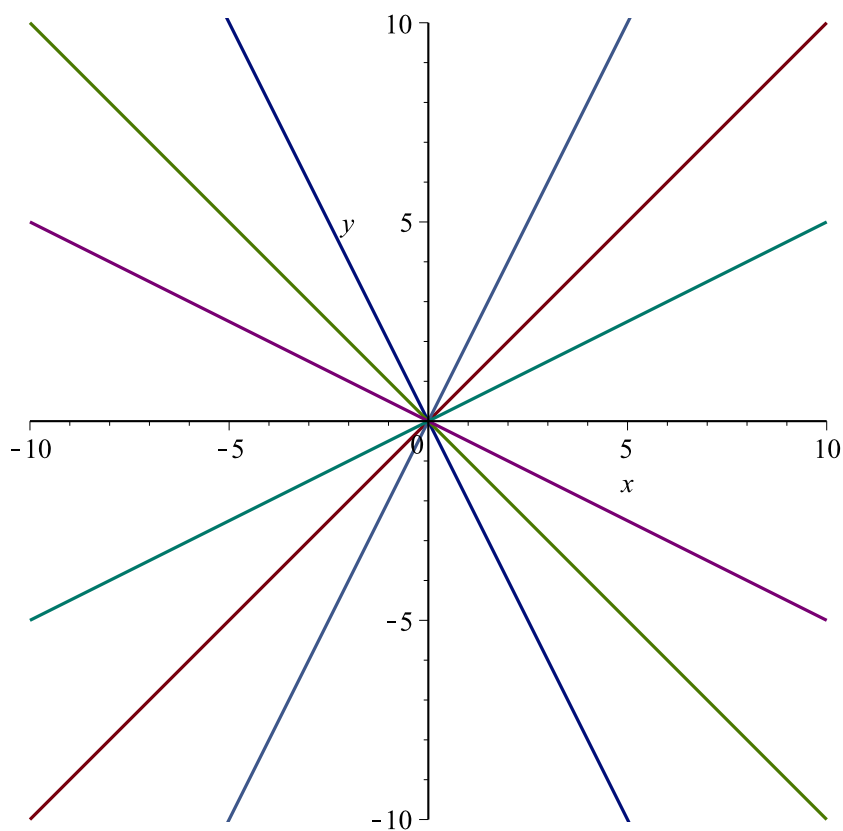
> *restart*

> $Ecua := (x^2 - y(x) \cdot x^2) + (y(x)^2 + x \cdot y(x)^2) \cdot diff(y(x), x) = 0$

(3)

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

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

$$[\_separable] \tag{4}$$

> $M := factor(x^2 - y \cdot x^2)$

$$M := -x^2\, (y - 1) \tag{5}$$

> $N := factor(y^2 + x \cdot y^2)$

$$N := y^2\, (x + 1) \tag{6}$$

> $P := -x^2$

$$P := -x^2 \tag{7}$$

> $Q := y - 1$

$$Q := y - 1 \tag{8}$$

> $R := x + 1$

$$R := x + 1 \tag{9}$$

> $S := y^2$

$$S := y^2 \tag{10}$$

> $SolGral := int\left(\dfrac{P}{R}, x\right) + int\left(\dfrac{S}{Q}, y\right) = \_C1$

$$SolGral := -\frac{1}{2}\, x^2 + x - \ln(x + 1) + \frac{1}{2}\, y^2 + y + \ln(y - 1) = \_C1 \tag{11}$$

> $Ecuacion := \left(4 \cdot x^2 + x \cdot y(x) - 3 \cdot y(x)^2\right) + \left(-5 \cdot x^2 + 2 \cdot x \cdot y(x) + y(x)^2\right) \cdot diff(y(x), x) = 0$

$$Ecuacion := 4\, x^2 + x\, y(x) - 3\, y(x)^2 + \left(-5\, x^2 + 2\, x\, y(x) + y(x)^2\right) \left(\frac{d}{dx}\, y(x)\right) = 0 \tag{12}$$

> $odeadvisor(Ecuacion)$

$$[[\_homogeneous, class\ A], \_rational, \_dAlembert] \tag{13}$$

> $EcuaDos := factor(isolate(simplify(eval(subs(y(x) = x \cdot u(x), Ecuacion))), diff(u(x), x)))$

$$EcuaDos := \frac{d}{dx}\, u(x) = -\frac{(u(x) - 1)\, (u(x) - 2)\, (u(x) + 2)}{x\, \left(u(x)^2 + 2\, u(x) - 5\right)} \tag{14}$$

> $odeadvisor(EcuaDos)$

$$[\_separable] \tag{15}$$

> $P := \dfrac{1}{x}$

$$P := \frac{1}{x} \tag{16}$$

> $R := \dfrac{(u - 1)\, (u - 2)\, (u + 2)}{(u^2 + 2\, u - 5)}$

$$R := \frac{(u - 1)\, (u - 2)\, (u + 2)}{u^2 + 2\, u - 5} \tag{17}$$

> $SolDos := int(P, x) + int\left(\dfrac{1}{R}, u\right) = \_C1$

$$\tag{18}$$

$$SolDos := \ln(x) + \frac{2}{3} \ln(u-1) - \frac{5}{12} \ln(u+2) + \frac{3}{4} \ln(u-2) = \_C1 \tag{18}$$

> $SolDosMedio := expand(\exp(lhs(SolDos))) = \_C1$

$$SolDosMedio := \frac{x(u-1)^{2/3}(u-2)^{3/4}}{(u+2)^{5/12}} = \_C1 \tag{19}$$

> $SolFinal := simplify\left(subs\left(u = \frac{y}{x}, lhs(SolDosMedio)\right)\right) = \_C1$

$$SolFinal := \frac{x\left(-\dfrac{-y+x}{x}\right)^{2/3}\left(-\dfrac{-y+2x}{x}\right)^{3/4}}{\left(\dfrac{y+2x}{x}\right)^{5/12}} = \_C1 \tag{20}$$

>
>