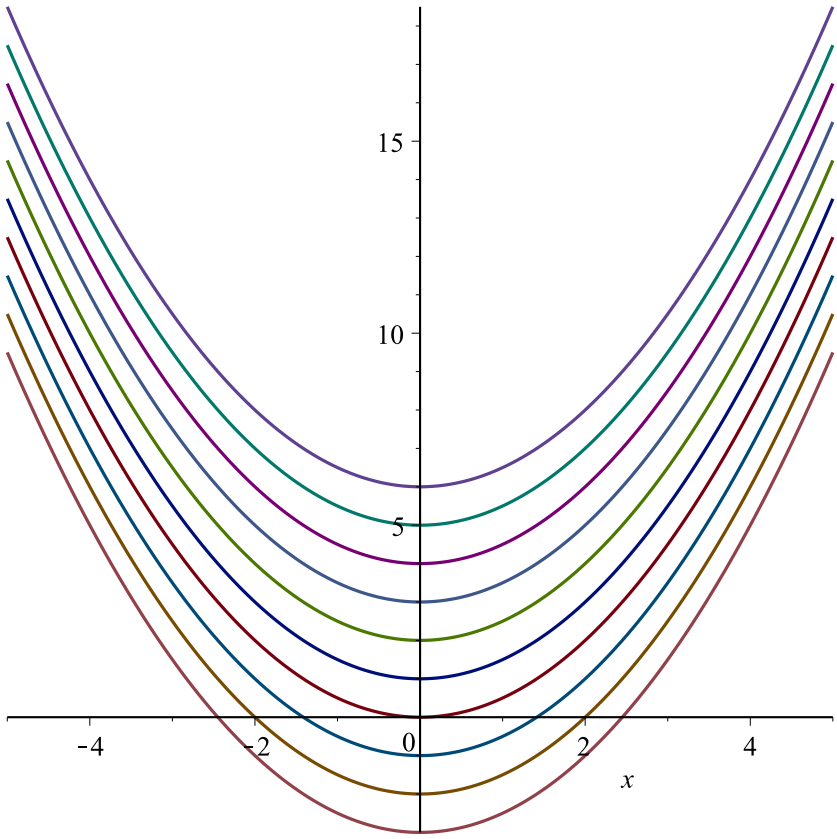
```
> restart
> Ecua := y'=x
```

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

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

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

```
> plot( [subs(_C1 = 0, rhs(SolGral) ), subs(_C1 = 1, rhs(SolGral) ), subs(_C1 = 2,
      rhs(SolGral) ), subs(_C1 = 3, rhs(SolGral) ), subs(_C1 = 4, rhs(SolGral) ), subs(_C1 = 5,
      rhs(SolGral) ), subs(_C1 = 6, rhs(SolGral) ), subs(_C1 = -1, rhs(SolGral) ), subs(_C1 =
      -2, rhs(SolGral) ), subs(_C1 = -3, rhs(SolGral) ) ], x = -5 ..5 )
```




```
> restart
> EcuaNoLineal := 2·y·(y'+2) - x·(y')^2 = 0
```

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

```
> Soluciones := dsolve(EcuaNoLineal)
```

(4)

$$Soluciones := y(x) = -4\,x,\ y(x) = 0,\ y(x) = \frac{1}{2}\ \frac{x\,(-x+2\_C1)^2}{\_C1^2\left(-\frac{-x+2\_C1}{\_C1}+2\right)} \tag{4}$$

> $Soluciones[1]; Soluciones[2]; simplify(Soluciones[3])$

$$y(x) = -4\,x$$
$$y(x) = 0$$
$$y(x) = \frac{1}{2}\ \frac{(-x+2\_C1)^2}{\_C1} \tag{5}$$

> $SolucionGeneral := simplify(Soluciones[3])$

$$SolucionGeneral := y(x) = \frac{1}{2}\ \frac{(-x+2\_C1)^2}{\_C1} \tag{6}$$

> $SolucionParticular[1] := subs(\_C1 = 10, SolucionGeneral)$

$$SolucionParticular_1 := y(x) = \frac{1}{20}\ (-x+20)^2 \tag{7}$$

> $SolucionParticular[2] := subs(\_C1 = \mathrm{sqrt}(2), SolucionGeneral)$

$$SolucionParticular_2 := y(x) = \frac{1}{4}\ \left(-x+2\sqrt{2}\right)^2\sqrt{2} \tag{8}$$

> $SolucionParticular[3] := subs\left(\_C1 = \frac{7}{8}, SolucionGeneral\right)$

$$SolucionParticular_3 := y(x) = \frac{4}{7}\ \left(-x+\frac{7}{4}\right)^2 \tag{9}$$

> $SolucionSingular[1] := Soluciones[1]$

$$SolucionSingular_1 := y(x) = -4\,x \tag{10}$$

> $SolucionSingular[2] := Soluciones[2]$

$$SolucionSingular_2 := y(x) = 0 \tag{11}$$

> $ParametroUno := solve(rhs(SolucionGeneral) = rhs(SolucionParticular[1]), \_C1)$

$$ParametroUno := 10,\ \frac{1}{40}\ x^2 \tag{12}$$

> $ParametroDos := solve(rhs(SolucionGeneral) = rhs(SolucionSingular[1]), \_C1)$

$$ParametroDos := -\frac{1}{2}\ x,\ -\frac{1}{2}\ x \tag{13}$$

> $ParametroTres := solve(rhs(SolucionGeneral) = rhs(SolucionParticular[3]), \_C1)$

$$ParametroTres := \frac{7}{8},\ \frac{2}{7}\ x^2 \tag{14}$$

> $ParametroCuatro := solve(rhs(SolucionGeneral) = rhs(SolucionParticular[2]), \_C1)$

$$ParametroCuatro := \frac{1}{8}\ \sqrt{2}\ x^2, \sqrt{2} \tag{15}$$

> $ParametroCinco := solve(rhs(SolucionGeneral) = rhs(SolucionSingular[2]), \_C1)$

$$ParametroCinco := \frac{1}{2}\ x,\ \frac{1}{2}\ x \tag{16}$$

> $CompUno := simplify(eval(subs(y(x) = rhs(SolucionGeneral), EcuaNoLineal)))$

$$CompUno := 0 = 0 \tag{17}$$

> $CompDos := simplify(eval(subs(y(x) = rhs(SolucionParticular[2]), EcuaNoLineal)))$

$$CompDos := 0 = 0 \quad (18)$$

> $CompTres := simplify(eval(subs(y(x) = rhs(SolucionSingular[1]), EcuaNoLineal)))$

$$CompTres := 0 = 0 \quad (19)$$

> $CompCuatro := simplify(eval(subs(y(x) = rhs(SolucionSingular[2]), EcuaNoLineal)))$

$$CompCuatro := 0 = 0 \quad (20)$$

> $restart$

> $Ecua := y' = \frac{y}{x}$

$$Ecua := \frac{d}{dx} y(x) = \frac{y(x)}{x} \quad (21)$$

> $SolGral := dsolve(Ecua)$

$$SolGral := y(x) = \_C1\, x \quad (22)$$

> $plot\left(\left[subs(\_C1 = 1, rhs(SolGral)), subs(\_C1 = -1, rhs(SolGral)), subs\left(\_C1 = \frac{1}{2}, rhs(SolGral)\right), subs\left(\_C1 = -\frac{1}{2}, rhs(SolGral)\right), subs(\_C1 = 3, rhs(SolGral)), subs(\_C1 = -3, rhs(SolGral))\right], x = -5..5\right)$