

> restart

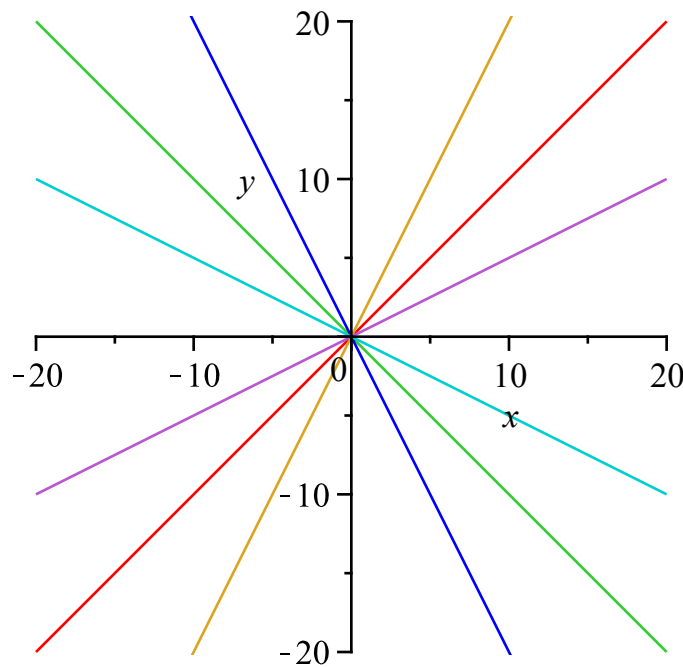
> Ecuacion := diff(y(x), x) = $\frac{y(x)}{x}$

$$\text{Ecuacion} := \frac{d}{dx} y(x) = \frac{y(x)}{x} \quad (1)$$

> Solucion := dsolve(Ecuacion)

$$\text{Solucion} := y(x) = _C1 x \quad (2)$$

> plot($\left[\text{subs}(_C1 = 1, \text{rhs}(\text{Solucion})), \text{subs}(_C1 = -1, \text{rhs}(\text{Solucion})), \text{subs}(_C1 = 2, \text{rhs}(\text{Solucion})), \text{subs}(_C1 = -2, \text{rhs}(\text{Solucion})), \text{subs}\left(_C1 = \frac{1}{2}, \text{rhs}(\text{Solucion})\right), \text{subs}\left(_C1 = -\frac{1}{2}, \text{rhs}(\text{Solucion})\right) \right]$, x=-20..20, y=-20..20, scaling=CONSTRAINED)



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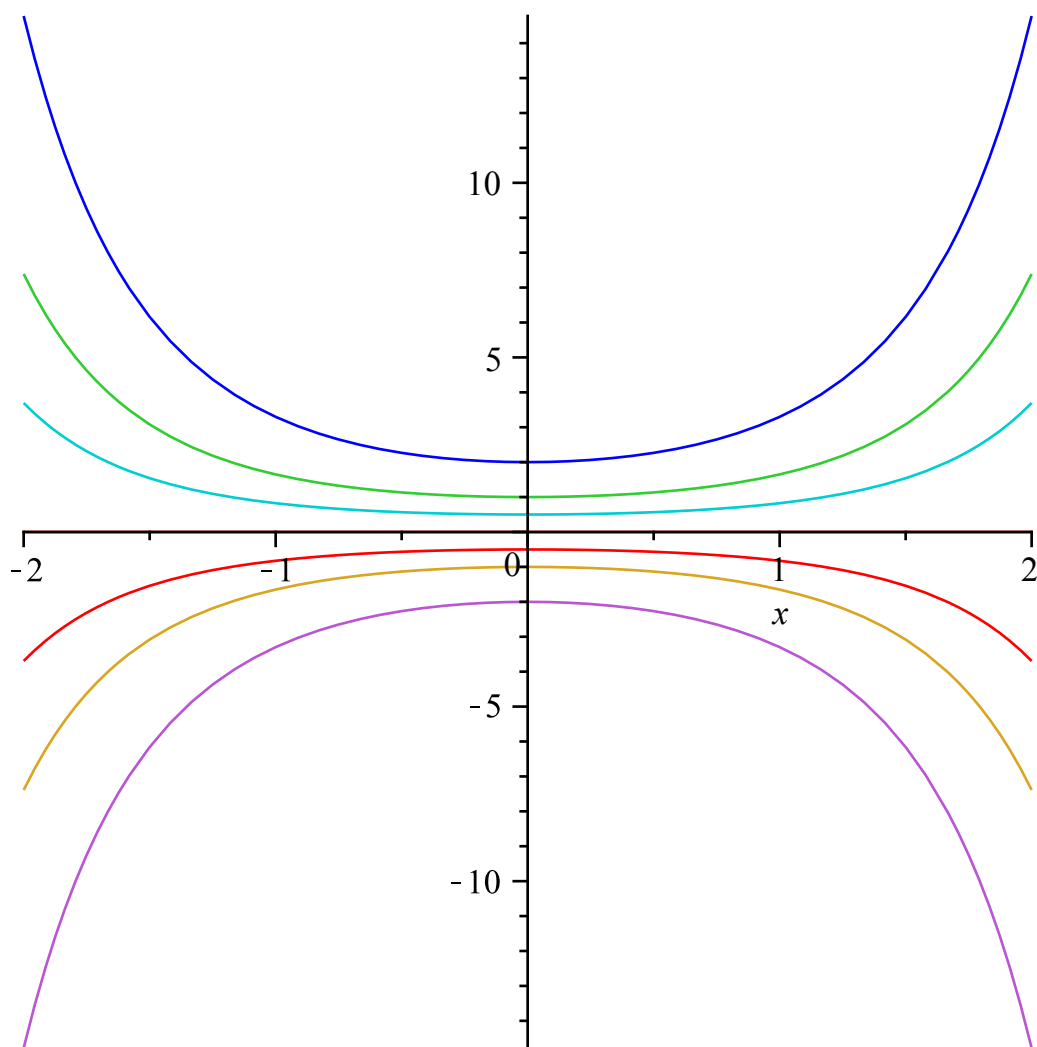
> Ecuacion := diff(y(x), x) = x*y(x)

$$\text{Ecuacion} := \frac{d}{dx} y(x) = x y(x) \quad (3)$$

> Solucion := dsolve(Ecuacion)

$$\text{Solucion} := y(x) = _C1 e^{\frac{1}{2} x^2} \quad (4)$$

> plot($\left[\text{subs}(_C1 = 0, \text{rhs}(\text{Solucion})), \text{subs}(_C1 = 1, \text{rhs}(\text{Solucion})), \text{subs}(_C1 = -1, \text{rhs}(\text{Solucion})), \text{subs}(_C1 = 2, \text{rhs}(\text{Solucion})), \text{subs}(_C1 = -2, \text{rhs}(\text{Solucion})), \text{subs}\left(_C1 = \frac{1}{2}, \text{rhs}(\text{Solucion})\right), \text{subs}\left(_C1 = -\frac{1}{2}, \text{rhs}(\text{Solucion})\right) \right]$, x=-2..2)



> *Solucion*

$$y(x) = _C1 e^{\frac{1}{2} x^2} \quad (5)$$

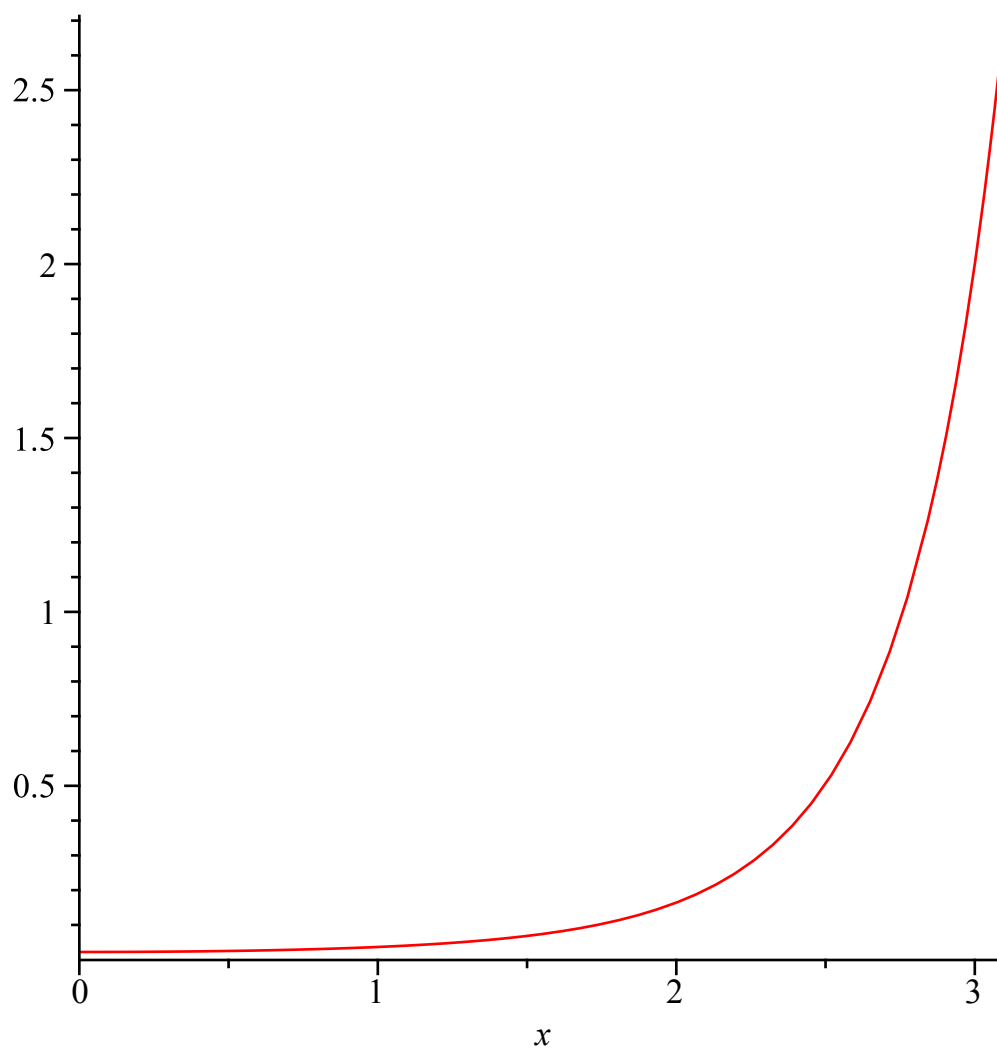
> *Parametro := isolate(subs(x=3, rhs(Solucion) = 2), _C1)*

$$Parametro := _C1 = \frac{2}{e^{\frac{9}{2}}} \quad (6)$$

> *SolucionParticular := subs(_C1 = rhs(Parametro), Solucion)*

$$SolucionParticular := y(x) = \frac{2 e^{\frac{1}{2} x^2}}{e^{\frac{9}{2}}} \quad (7)$$

> *plot(rhs(SolucionParticular), x=0..3.1)*



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> Condiciones := y(3) = 2;
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$$\text{Condiciones} := y(3) = 2$$

(8)

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> SolPart := simplify(dsolve( {Ecuacion, Condiciones} )); evalf(%, 3)
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$$\text{SolPart} := y(x) = 2 e^{\frac{1}{2} (x-3) (x+3)}$$

$$y(x) = 2. e^{0.500 (x-3.) (x+3.)}$$

(9)

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> evalf(SolucionParticular, 3)
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$$y(x) = 0.0222 e^{0.500 x^2}$$

(10)