

> restart

> Ecua := diff(f(x, y), x\$2) + 4·diff(f(x, y), x, y) + 4·diff(f(x, y), y\$2) = 0

$$Ecua := \frac{\partial^2}{\partial x^2} f(x, y) + 4 \frac{\partial^2}{\partial x \partial y} f(x, y) + 4 \frac{\partial^2}{\partial y^2} f(x, y) = 0 \quad (1)$$

> with(PDEtools) :

> SolGral := pdsolve(Ecua)

$$SolGral := f(x, y) = f_1(y - 2x) + f_2(y - 2x)x \quad (2)$$

> SolGralDos := f(x, y) = f_1(y - 2x) + f_2(y - 2x)y

$$SolGralDos := f(x, y) = f_1(y - 2x) + f_2(y - 2x)y \quad (3)$$

> ComprobarUno := simplify(eval(subs(f(x, y) = rhs(SolGral), Ecua)))

$$ComprobarUno := 0 = 0 \quad (4)$$

> ComprobarDos := simplify(eval(subs(f(x, y) = rhs(SolGralDos), Ecua)))

$$ComprobarDos := 0 = 0 \quad (5)$$

> restart

> Ecua := diff(z(x, y), y\$3) - diff(z(x, y), x\$2) + 8·diff(z(x, y), x, y) = 0

$$Ecua := \frac{\partial^3}{\partial y^3} z(x, y) - \frac{\partial^2}{\partial x^2} z(x, y) + 8 \frac{\partial^2}{\partial x \partial y} z(x, y) = 0 \quad (6)$$

> SolGral := pdsolve(Ecua)

$$SolGral := z(x, y) = c_3 + c_4 \left(\frac{(-C1x + C2y + c_3)_{-C1(-C1-8-C2)}}{C2^3} \right) + c_5 e \quad (7)$$

> DerSolGralX := diff(SolGral, x)

$$DerSolGralX := \frac{\partial}{\partial x} z(x, y) = c_4_{-C1} + \frac{c_5_{-C1}^2 (-C1 - 8_{-C2}) e}{C2^3} \quad (8)$$

> DerDerSolGralXX := diff(SolGral, x\$2)

$$DerDerSolGralXX := \frac{\partial^2}{\partial x^2} z(x, y) = \frac{c_5_{-C1}^4 (-C1 - 8_{-C2})^2 e}{C2^6} \quad (9)$$

> DerDerSolGralXY := diff(SolGral, x, y)

$$DerDerSolGralXY := \frac{\partial^2}{\partial x \partial y} z(x, y) = \frac{c_5_{-C1}^3 (-C1 - 8_{-C2})^2 e}{C2^5} \quad (10)$$

> DerDerDerSolGralYYY := diff(SolGral, y\$3)

$$DerDerDerSolGralYYY := \frac{\partial^3}{\partial y^3} z(x, y) \quad (11)$$

$$= \frac{c_5 _C1^3 (_C1 - 8 _C2)^3 e^{\frac{(_C1 x + _C2 y + c_3) _C1 (_C1 - 8 _C2)}{_C2^3}}}{_C2^6}$$

> Ecua

$$\frac{\partial^3}{\partial y^3} z(x, y) - \frac{\partial^2}{\partial x^2} z(x, y) + 8 \frac{\partial^2}{\partial x \partial y} z(x, y) = 0 \quad (12)$$

> Comprobar := simplify(rhs(DerDerDerSolGralYYY) - rhs(DerDerSolGralXX) + 8
·rhs(DerDerSolGralXY)) = 0

$$\text{Comprobar} := 0 = 0 \quad (13)$$

> restart

> Ecua := diff(f(x, y), x\$2) + diff(f(x, y), y\$2) = 0

$$\text{Ecua} := \frac{\partial^2}{\partial x^2} f(x, y) + \frac{\partial^2}{\partial y^2} f(x, y) = 0 \quad (14)$$

> SolGral := pdsolve(Ecua)

$$\text{SolGral} := f(x, y) = f_1(y - 1x) + f_2(y + 1x) \quad (15)$$

> restart

> Ecua := diff(y(x, t), x\$2) + 6·diff(y(x, t), x, t) = 0

$$\text{Ecua} := \frac{\partial^2}{\partial x^2} y(x, t) + 6 \frac{\partial^2}{\partial t \partial x} y(x, t) = 0 \quad (16)$$

> SolGral := pdsolve(Ecua)

$$\text{SolGral} := y(x, t) = f_1(t) + f_2(t - 6x) \quad (17)$$

> SolPart := y(x, t) = exp(t) + cos(t - 6x)

$$\text{SolPart} := y(x, t) = e^t + \cos(t - 6x) \quad (18)$$

> Comprobar := simplify(eval(subs(y(x, t) = rhs(SolPart), Ecua)))

$$\text{Comprobar} := 0 = 0 \quad (19)$$

> SolPartDos := y(x, t) = t^3 + sqrt(t - 6x)

$$\text{SolPartDos} := y(x, t) = t^3 + \sqrt{t - 6x} \quad (20)$$

> ComprobarDos := simplify(eval(subs(y(x, t) = rhs(SolPartDos), Ecua)))

$$\text{ComprobarDos} := 0 = 0 \quad (21)$$

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