

> restart

> $Ecua := \text{diff}(z(x, y), x, y) + 6 \cdot \text{diff}(z(x, y), y^2) - 2 \cdot \text{diff}(z(x, y), x) = 0$

$$Ecua := \frac{\partial^2}{\partial x \partial y} z(x, y) + 6 \frac{\partial^2}{\partial y^2} z(x, y) - 2 \frac{\partial}{\partial x} z(x, y) = 0 \quad (1)$$

> $EcuaSeparable := \text{simplify}(\text{eval}(\text{subs}(z(x, y) = F(x) \cdot G(y), Ecua)))$

$$EcuaSeparable := 6 F(x) \left(\frac{d^2}{dy^2} G(y) \right) - 2 \left(G(y) - \frac{\frac{d}{dy} G(y)}{2} \right) \left(\frac{d}{dx} F(x) \right) = 0 \quad (2)$$

> $EcuaSeparada := \frac{\left(\text{simplify} \left(\text{lhs}(EcuaSeparable) + 2 \left(G(y) - \frac{\frac{d}{dy} G(y)}{2} \right) \left(\frac{d}{dx} F(x) \right) \right) \right)}{6 \cdot F(x) \cdot 2 \left(G(y) - \frac{\frac{d}{dy} G(y)}{2} \right)}$

$$EcuaSeparada := \frac{\left(\text{rhs}(EcuaSeparable) + 2 \left(G(y) - \frac{\frac{d}{dy} G(y)}{2} \right) \left(\frac{d}{dx} F(x) \right) \right)}{6 \cdot F(x) \cdot 2 \left(G(y) - \frac{\frac{d}{dy} G(y)}{2} \right)} = \frac{\frac{d^2}{dy^2} G(y)}{2 \left(G(y) - \frac{\frac{d}{dy} G(y)}{2} \right)} = \frac{\frac{d}{dx} F(x)}{6 F(x)} \quad (3)$$

> $EcuaX := \text{rhs}(EcuaSeparada) = 3$

$$EcuaX := \frac{\frac{d}{dx} F(x)}{6 F(x)} = 3 \quad (4)$$

> $EcuaY := \text{lhs}(EcuaSeparada) = 3$

$$EcuaY := \frac{\frac{d^2}{dy^2} G(y)}{2 \left(G(y) - \frac{\frac{d}{dy} G(y)}{2} \right)} = 3 \quad (5)$$

> $SolX := \text{dsolve}(EcuaX)$

$$SolX := F(x) = c_1 e^{18x} \quad (6)$$

> $SolY := \text{dsolve}(EcuaY)$

$$SolY := G(y) = c_1 e^{\frac{(-3 + \sqrt{33})y}{2}} + c_2 e^{-\frac{(3 + \sqrt{33})y}{2}} \quad (7)$$

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$$SolFinal := z(x, y) = subs(c_1 = 1, rhs(SolX)) \cdot (rhs(SolY))$$

$$SolFinal := z(x, y) = e^{18x} \left(c_1 e^{\frac{(-3 + \sqrt{33})y}{2}} + c_2 e^{-\frac{(3 + \sqrt{33})y}{2}} \right)$$

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(8)