Answer on Question #66107 – Math – Differential Equations

Question

The solution of the pde dz/dx +dz/dy = z^2 is z = -[y+f(x-y)]. True or false, why?

Solution

If $z = -\big(y + f(x-y)\big)$, then

$\frac{\partial z}{\partial x} = -f'(x-y),\ \frac{\partial z}{\partial y} = -1 + f'(x-y).$

$\frac{\partial z}{\partial x} + \frac{\partial z}{\partial y} = -1 \neq z^2,$ hence $z = -\big(y + f(x-y)\big)$ is not the solution of the partial differential equation $\frac{\partial z}{\partial x} + \frac{\partial z}{\partial y} = z^2$.

Answer: False.