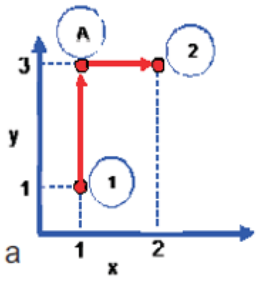
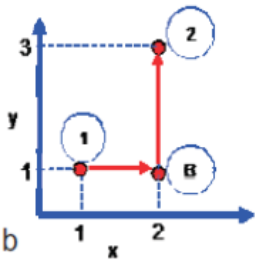
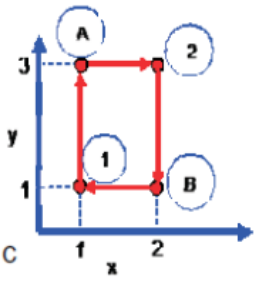
Statements for differentials

For a differential that is not exact, which statements holds? (3 answers)





Two different paths to go from state 1 to state 2



A closed path, cyclic integral

Three ways to check if a differential is exact:

1. For mixed differentials the order of differentiation is not important: $\frac{\partial^2 z}{\partial x \partial y} = \frac{\partial^2 z}{\partial y \partial x}$

2. The integral over the closed path is zero: $\oint dz(x,y) = 0$ (right picture)

3. The integration does not depend on the integration path, different paths give the same result $\int_{1-A-2} dz(x,y) = \int_{1-B-2} dz(x,y)$ (left picture).