Answer on Question #46164 – Math – Analytic Geometry

Find the equation of the cylinder with base curve x^2+y^2+z^2-2x-4z+1=0, 2X+y+z=2

Solution.

$\boldsymbol{f(x,y,z) = x^2 + y^2 + z^2 - 2x - 4z + 1}$,

$\boldsymbol{2x + y + z = 2 \rightarrow \ \ z = 2 - 2x - y}$.

So, $\boldsymbol{f(x,y) = x^2 + y^2 + (2 - 2x - y)^2 - 2x - 4(2 - 2x - y) + 1 =}$

$\boldsymbol{= 5x^2 + 2y^2 + 4xy - 2x - 3}$.

Therefore, equation of the cylinder is

$\boldsymbol{5x^2 + 2y^2 + 4xy - 2x - 3 = 0}$.