$F = \nabla\varphi + \nabla \times A$ → help question

↓ ?

$F = \left[x^2(x+y-z),\ y^2(y+z-x),\ z^2(z+x-y) \right]$

$\nabla F = \Delta\varphi = 3x^2 + 3y^2 + 2z^2 = 2(x^2+y^2+z^2)$

$\nabla\varphi = x^3 + y^3 + z^3$

$\varphi = \frac{1}{4}(x^4 + y^4 + z^4)$

$\Leftrightarrow \nabla \times A = F - \nabla\varphi$

↳ $A' = A + \nabla\psi$

$\Leftrightarrow \nabla A' = \nabla A + \Delta\psi = 0$

$\Leftrightarrow \Delta\psi = x^2 z + y^2 z$

$\Leftrightarrow \nabla\psi = \frac{x^3}{3} z + \frac{y^3}{3} z$

$\Leftrightarrow \psi = z\frac{1}{12}(x^4 + y^4)$

$\nabla\psi = \{ \dots ; \dots \dots \dots \}$