

Name _____

Consider the conservative vector field $\mathbf{F} = \langle f, g, h \rangle$ given by

$$\mathbf{F} = \langle y, x + z^2, 2yz + 1 \rangle$$

Find a potential function φ for \mathbf{F} . You may use the following strategy:

1. Integrate f with respect to x (include arbitrary $c(y, z)$).
2. Compute φ_y and set it equal to g to obtain $c_y(y, z)$.
3. Integrate $c_y(y, z)$ with respect to y to obtain $c(y, z)$ (include arbitrary $d(z)$).
4. Compute φ_z and set it equal to h to obtain $d(z)$.