JD 14.3:

Given the fct f, with $f(x,y,z) = x^2y + \ln(x+z)$

and the direction vector $\vec{v} = \begin{bmatrix} 2/3 \\ -2/3 \\ 1/3 \end{bmatrix}$,

Calculate $D_{\vec{v}} f(\vec{x})$ where $\vec{x}$ is shorthand for (x,y,z), or $\begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Specifically calculate $D_{\vec{v}} f(1,2,0)$.

Recall that $D_{\vec{v}} f(\vec{x})$ is defined as $\frac{d}{dt} f(\vec{x}+t\vec{v})\Big|_{t=0}$,

i.e, you form the SV fct $g(t) := f(\vec{x}+t\vec{v})$

and calculate $g'(0)$