1.   (a) Compute the directional derivative $\left(D_u f\right)_P$ when $f(x,y,z) = y + 2ze^{xy}$, P is the point $(2,0,3)$ and $u = \dfrac{1}{\sqrt{6}}\langle 1, -2, 1\rangle$.

(b)   Find the equation of the tangent plane to the level surface $f(x,y,z) = y + 2ze^{xy} = 6$ at the point $P(2,0,3)$ from part (a).